

amateur radio

DECEMBER, 1973



- TWO METRE TRANSVERTER
- VERTICAL AERIAL — NO GROUNDPLANE
- DIPLEXER FOR THE DISCONE
- DISCONE ANTENNA MEASUREMENTS
- LAS BALSAS
- NATIONAL FIELD DAY RULES

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

GRID DIP METER SPECIFICATION

Model TE-15

Freq. Range: 440kHz-280MHz
in 6 Coils
A Coil 0.44-1.3MHz
B Coil 1.3-4.3MHz
C Coil 4.14MHz
D Coil 14.40MHz
E Coil 120-200MHz
Transistor: 3 TR's & 1 Diode
Meter: 500uA F.s.
Battery: 9V (8L-006P)
Dimensions: 180x80x40mm
Weight: 730g

Price \$36.50
P & P \$1.00

DELUXE AUDIO GENERATOR SPECIFICATION

Model HE-22D Model TE-22D

Freq. Range: Sin: 20Hz-200kHz
Square: 20Hz-25kHz
Output Voltage: Sin: 7 volt,
Square 7 volt
Output Impedance: 1000 ohm
Freq. Accuracy: $\pm 3\%$, $\pm 2\text{Hz}$
Distortion: Less than 2%
Tube Complement: 6BM8
12 AT7, 624
Power Source: 105-125V, 220-
240V AC, 50/60 cps, 18W
With Attenuation Range
4 Ranges: 1/1, 1/10, 1/100,
1/1K

Price \$49.50
P & P \$2.00

Compact-Space Saving
Printed Circuit for uniform
Characteristics.
Low Distortion
Dimensions: 140 x 215 x 170mm
Weight: 2.8kg.

P.M.G. TYPE TELEPHONES-DIAL TYPE EXTENSION

Ericson type manufactured by
L. M. Ericson. As used by PMG
Dist. As new condition. Dial in
black. \$18.50 Tested, plug 75c
Base Phone Chrome Dial Stand-
ard type. Rebuilt extension
\$7.95. Few only plug 75c
Plastic Type. Standard PMK type.
Manufactured by L. M. Ericson.
As new tested. All phones fitted
with standard phone plug and
socket. \$17.50, p & p 75c
Double Phone Plug & Socket, 75c
Standard 2 Circuit Phone Plug
PMG Type 39c
PMG Type Counters, 4 digit, 48 Volt operation 96c
PMG Type Telephone Plug & Socket, round type
PMG Type Phone Plug & Socket, standard Ericson
Type White Plastic 96c per pair
PMG Type Telephone Extension Bells, 48V 82.50
230 Volt RVB Horn Tested 75.50

MODEL C1000

Price \$6.95

Is the ideal low cost pocket
meter
AC Volts: 10V, 50V, 250V, 1000V
(1000 ohm/V)
DC Volts: 10V, 50V, 250V, 1000V,
(1000 ohm/V)
DC Current: 1mA, 100mA
OHMS: 150 ohms
Resistors: $\pm 10\%$ to $\pm 22\%$
Dimensions: 4 1/4" x 3 1/8" x 1 1/8"
4 1/4" x 3 1/8" x 1 1/8"



200-H



Price \$12.50
90° quadrant meter.
Scale size:
AC/V: 10V, 50V, 100V, 500V,
1000V, (10,000 ohm/V)
DC/V: 5V, 25V, 50V, 250V,
500V, 2500V, (20,000 ohm/V)
DC/A: 50uA, 2.5mA, 250mA
OHMS: 800 ohm, 484 ohm
Capacitance: 100pF to 0.1uF,
db: $\pm 20\text{db}$ to $\pm 22\text{db}$
Audio Output: 10V, 50V, 120V,
1000V AC
Approx size: 4 1/4" x 3 1/8" x 1 1/8"

CT-500/P



Price \$16.75
Popular medium-size, mirror
scale, overload protected
AC/DC meter.
100V, 50V, 250V, 500V,
1000V, (10,000 ohm/V)
OC/V: 2.5V, 10V, 50V, 250V,
500V, 5000V, (5mA, 50mA,
500mA)
OHMS: 12 ohm, 120 ohm, 1.2
ohm, 12k ohm
db: $\pm 20\text{db}$ to $\pm 62\text{db}$
Approx. size: 5 1/4" x 3 5/8" x
1 1/4"

SOLID STATE WIDEBAND RF SIGNAL GENERATOR MODEL SG-402



This is an all solid state, wide-
band RF Signal Generator
which produces low impedance
low distortion RF signals. It is
highly dependable and easy to
operate, and is a handy
working instrument for service
benches and electronic equip-
ment production centres.

SPECIAL FEATURES

1. Generates wide range signals from 100kHz to 20MHz in six frequency ranges.
2. All solid state construction for instant waveforms, compact and lightweight portability.
3. Includes 400Hz signal source for modulation of output signal, which can be modulated by external sources.

Price \$99.50, p & p \$2.00

TRIO 3" OSCILLISCOPE DC — 1.5 MHz MODEL CO-1303A



- SPECIAL FEATURES
1. Vertical sensitivity of 20 mV/cm, three step attenuation, AC DC operation & wideband frequency response from DC to 1.5MHz
 2. DC vertical and horizontal amplifiers for wide versatility make possible external sweep speeds of less than 1Hz.
 3. All solid state construction for compact, lightweight portability
 4. Smoked filter glass CRT face and exclusive designed graticule, graduated in dB for clear waveform comparisons
 5. Direct input to 150MHz for SSB and AM transmission monitoring.

Price \$150, p & p \$2.00

THIS MONTH'S SPECIAL

MAGNAVOX 8-30 Speakers 8"

30 Watt \$13.95

PEAK BATA Speaker, 8"

8 Watt \$8.95



MIDLAND MODEL 13-700 TRANSISTOR 2-CHANNEL CAL SIGNAL 1 WATT TRANSCIVER

SPECIFICATIONS

Circuit: 1 Watt, 2-Channel Solid
State Transceiver, 12 Trans-
istors, 1-Diode, 1-Thermistor
Receiving Frequency: 2-Chan-
nels available, 27.240MHz
Crystals Factory installed in
number one position.
Receiving System: Crystal con-
trolled, super-heterodyne sys-
tem with tuned RF stage.
Intermediate Freq. 455 kHz
Transmit Section: Crystal Con-
trolled Oscillator followed by
RF Amplifier.
Modulation System: Push-pull
high level class "B"
RF Input Power: 1 Watt.
Frequency Tolerance: $\pm 0.005\%$



Receiver Sensitivity: 1 uV or better at 10 db S/N.
Speaker/Microphone: 2 1/2" PM Dynamic, 9-ohm
Accessory Jacks: AC, Earphone and Charge.
Power Source: 12V DC (8 x 1.5V "AA" cells)
Price \$39.75 each or \$79.00 per pair
Optional (Channel 2) 27.880MHz \$5.00 EXTRA

RF SIGNAL GENERATOR Model TE-20D SPECIFICATIONS

Dial has 7 separate band TE-20D
covers 120kHz — 500MHz
(8 Fundamental Bands & 1 Harmonic
Band)
Freq. Accuracy: $\pm 0.01\%$ — 2%
Audio Output: to 8 volt
Internal Modulator: 400Hz approx.
Tube Complement: 6BM8, 6AL5
Power Source: 105-125V, 220-240V
AC 50/60Hz, 12 watts

TE-20D employs a Xial socket and can be used

as below
a—Self-Calibration
b—Marker Generator
Small size-Space Saving.
Printed Circuit for a uniform characteristics.
Dimensions: 140x215x170mm
Weight: 2.8kg.

Price \$47.00, p & p \$2.00

DX150B REALISTIC WITH SEPARATE SPEAKER

The popular REALISTIC DX150B which has gone
from strength to strength with amateurs, short-
wave and broadcast listeners alike now has a
further improvement. A SEPARATE MATCHING
SPEAKER included.

The DX150B gives long-range, world-wide realistic
reception on 4 bands, including Broadcast. Fully
transistorized all solid state—no warm-up delays, the
DX150B will run on dry cells if current fails or is
not available, will operate from a 25V cigarette
lighter or any 12V DC service. A 240V AC power
supply is also built in. Over 30 semi-conductors—
product detector for SSB/CW, plus fast and slow
AVC—variable pitch BFO—illuminated electrical band-
spread, fully calibrated for amateur bands—cascade
RF stage—AFL for RF and AF—zero stabilised-OTL
audio—illuminated "5" meter.

Price \$229.00
P & P \$2.00

15" PIONEER GUITAR SPEAKER

15in Pioneer Low Frequency Speaker, Imp. 8 ohms.
Power, 30 Watts, R.M.S. Designed especially for
use with Bass Guitar or Electric Organ. Also ideal
for Stereo Woofer. Speaker.

Price \$29.50

RADIO SUPPLIERS

323 ELIZABETH STREET, MELBOURNE, VIC., 3000

Phones: 67-7329, 67-4286 All Mail to be addressed to above address

Our Disposals Store at 104 HIGGETT ST., RICHMOND (Phone 42-8136) is open Mondays to Fridays, 10.30 a.m. to 5.0 p.m.,
and on Saturdays to midday.

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA, FOUNDED 1910



DECEMBER, 1973

VOL. 41, No. 12

Price, 40 cents

Registered at the
G.P.O. Melbourne for
transmission by Post
as a Periodical—
Category "B"

CONTENTS

Editor:	
Bill Roper	VK3ARZ
Assistant Editor:	
Bruce Bathols	VK3ASE
Technical Editors:	
Bill Rice	VK3ABP
Ron Cook	VK3AFW
Publications Committee:	
John Adcock	VK3ACA
Rodney Champness	VK3UG
Syd Clark	VK3ASC
Ron Fisher	VK3OM
Ken Gillespie	VK3GK
Neil Osborne	VK3YEI
Gil Sones	VK3AUJ
Peter Wolfenden	VK3ZPA
Contributing Editors:	
Brian Austin	VK5CA
Deane Blackman	VK3TX
Peter Brown	VK4PJ
Eric Jamieson	VK5LP
Drafting Assistants:	
Andrew Davis	VK1DA
Gordon Row	L30187
Business Manager:	
Peter B. Dodd	VK3CIF

Enquiries and material to:
The Editor,
P.O. Box 2511W, Melbourne, 3001.

Copy is required by the third of each month. Acknowledgment may not be made unless specially requested. All important items should be sent by certified mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying any reason.

Advertising:

Advertising material should be sent direct to P.O. Box 150, Toorak, Vic., 3142, by the 25th of the second month preceding publication. Phone: 24-8652.

Hamads should be sent direct to P.O. Box 150, Toorak, Vic., 3142, by the 3rd of the month preceding publication.

Printers:

Chas E. Tully Pty. Ltd.
40 Hume Street, Huntingdale, 3166.
Phone: 543 1242.

Published monthly as the official journal by the Wireless Institute of Australia.

Reg. Office:
Above 474 Toorak Road, Toorak, Vic., 3142.
P.O. Box 150, Toorak, Vic., 3142

TECHNICAL —

A Diplexer for the Discone	9
A Two Metre Transverter	5
Commercial Kinks	23
Discone Antenna Measurements	11
How Safe is Your Aerial	14
Newcomers Notebook	22
Try This	22
Vertical Aerial needs no Groundplane	12

GENERAL —

AOCF Theory Examination, August, 1973	29
BERU (1973) Results	24
Las Balsas	19
Looking Back	13
Prince Phillip visits Townsville	24

DEPARTMENTS —

Awards Column	21
Contests	28
Hamads	30
Ionospheric Predictions	30
John Moyle Memorial National Field Day Contest 1974 Rules	28
Key Section	27
Letters to the Editor	21
Magazine Index	21
Project Australls	23
QSP	4
Silent Keys	30
VHF/UHF an expanding world	27
20 Years Ago	21

FRONT COVER :

H.R.H Prince Phillip operates the Townsville Amateur Radio Club's Station VK4TC and talks to the crew of the Las Balsas raft expedition. On the Duke's right is the Mayor of Townsville, Alderman Max Hooper.

Amateur Satellite Service

IARU Headquarters in a circular to all member societies advises that the FCC in the U.S.A. has issued a Notice of Inquiry seeking comments and suggestions from interested parties in the U.S.A. as to what rules should apply to the Amateur Satellite Service **IN SO FAR AS THE U.S.A. IS CONCERNED.**

It appears that hitherto the regulation of communications functions has been on an ad hoc basis. Now that longer life Oscars are in operation or are being planned, the FCC believes the time is ripe to regularise operations through satellites **IN SO FAR AS U.S.A. USERS ARE CONCERNED.**

The ARRL will be formally sending submissions to the FCC as the proper channel of communications between the amateur service and the FCC **IN SO FAR AS U.S.A. REGULATIONS ARE CONCERNED.**

The FCC have called for submissions to be made by **7th January next.** IARU Headquarters believes that comments from member societies will be useful because of the international aspects of the Amateur Satellite Service. The Executive of the WIA are in process of co-ordinating any views. Views which it is hoped will be sent in by VK amateurs. Views and comments which have already been requested from the relative technical Committees including Project Australis.

Why is the Executive taking this action?

Firstly to give IARU the benefit of Australian views on the subject. Secondly to crystallise our own thinking on the subject if the PMG's Department decide to draft Australian rules. Thirdly to determine what rules and regulations are desirable assuming that any are indeed required at all.

We have authority for Limited Licensees to use the Oscar satellite under their own call signs when the downlink is in the 10 metre band.

No separate licence is required to operate through a Satellite.

There are no planned uplinks on 10 metres to Satellites so our future 'Novices' could not operate through a Satellite even if the WIA pressures to allow Novices a segment on 10 metres proves successful.

Command stations, which are under the control of the Project Australis Group do not require separate licences and are authorised for higher power for command purposes.

The Group's business may be conducted over the air with Amsat stations as a special privilege relating to Oscar Satellites.

A special 2m to 70cm experimental repeater was licensed for user

familiarisation but is no longer required.

Our own authorities have also acted on an ad hoc basis. Whether or not any special rules or regulations will be deemed necessary remains to be seen.

Because the IARU needs assistance in this field it will be given. The information now collected could be useful for ourselves at a future date but the Executive hopes it will not be required because the amateur service and, ipso facto, the Amateur Satellite Service, should be largely self-regulatory.

If any member does have any views on the subject he should submit them through his Division or through one of the three Executive Committees concerned with the usage of the higher frequencies.

David A. Wardlaw

VK3ADW

President.

Mollish Reef Dx-pedition

Recognition of VK9JW for the ARRL DXCC Award was suspended by the ARRL following certain disputes.

The WIA supplied on 29th June 1973 the information sought of it by the ARRL.

The recognition of VK9JW for its DXCC is a matter for ARRL not the WIA. It is believed that the ARRL has referred the question to its DX Advisory Committee and is still to determine the question.

a two metre transverter

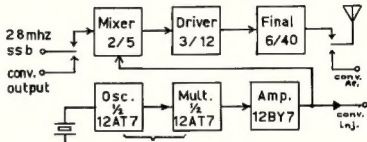
MIKE TRICKETT, VK3ASQ
8 Matlock Street, Herne Hill, Geelong, 3220.

Having seen the light, and turned to SSB operation on six metres several years ago, I decided to make the shift to SSB on the 144 MHz band as well. The resulting transverter was designed to operate in conjunction with an FT200 transceiver; however there should be no difficulty in adapting it to operate with another transceiver or transmitter. The FT200 lends itself nicely to transverter operation, the accessory socket on the back making available all supply voltages required plus relay terminals. It also has provision for removing the final stage heater supply, while still giving a low level output (about 1W PEP) from the driver stage to a phono type socket on the back. With these facilities available this transverter resulted.

The 28 MHz band was used as the IF because it has two main things in its favour. 28 to 30 MHz coverage giving 2 MHz tuning range, and the problem of images is minimised as the image frequency is 56 MHz away. Not much of a consideration at 6 or 2 metres, but a forthcoming project is a 432 MHz transverter and for convenience it was decided to use 28 MHz for all transverter IF's.

OPERATION

From the block diagram, it can be seen the transverter consists of 3 main sections; a crystal oscillator and multiplier chain producing RF at 116 MHz at about 1 watt, the transmitter section, and the receiver section. The oscillator section is straight forward, consisting of a crystal oscillator at 29 MHz, followed by two doubler stages producing 116 MHz output. The output tuned circuit of the oscillator chain couples to two points; the transmitting mixer, and the receiving mixer in the converter. The mixer V1 is the heart of



BLOCK DIAGRAM OF TRANSVERTER

the unit, and the section where the most experimentation was done. Several configurations and tube types were tried, but the QOE02-5 in the configuration shown here

brings the level up to that sufficient to drive the final.

V3, a QOE06-40 PA, is operated in A22 with metering in the cathode. These components are not labelled as any suitable meter will do the job with the appropriate shunt.

The bias arrangement utilises a voltage divider circuit for each stage; the bottom of each stage leg goes to a common point and is connected to earth via a contact on the TX-RX relay. In the receive position the full bias voltage of -100 is applied to the three stages cutting them off. The final has a zener diode in its bias supply to stabilise the bias at this point. In an earlier design, trouble was experienced with the negative voltage increasing at this point as the drive was increased, thus causing a flattening off of the plate current at about 120 mA. Then, no matter how much the drive was increased, no more plate current would result. This was traced to the final grid drawing current and developing additional negative voltage, thereby producing an undesirable ALC effect.

CONSTRUCTION

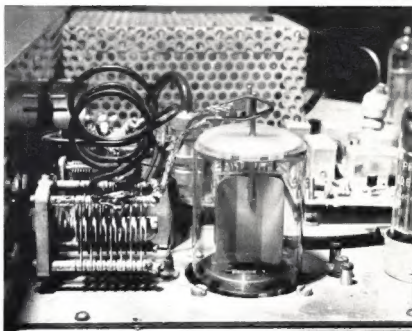
The unit was constructed on an aluminium chassis 12"x11 1/2"x2 1/2" using the layout as shown. On the vacant left hand side a 6 metre unit was constructed thereby providing 6 & 2 metre facilities. (the 5 metre unit will be the subject of a later article). The heaters were wired for 12 volts as the FT200 has a 12 volt heater line, usual VHF construction practices were followed, and a tin plate shield was soldered across the socket of V2 to shield input and output.

Mike VK3ASQ displaying the completed 6 and 2 metre transverter at a recent VK3 VHF Group meeting.

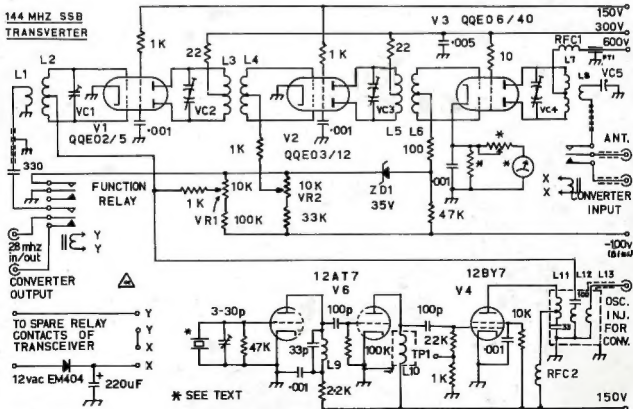


The oscillator section is first checked out. Plug in the 12AT7 and 12BY7 with a multimeter on the cold end of L9 and adjust L9 slug for an increase in voltage. A point will be reached where oscillation ceases and the voltage falls sharply; the slug should be set to a point just before this happens. The crystal should be pulled in and out a few times to ensure stable and reliable oscillation. L10 is tuned for maximum negative voltage at TP1, about 1 volt. A diode probe is connected to the center of the co-ax. going to the receive converter and L11 is adjusted for maximum

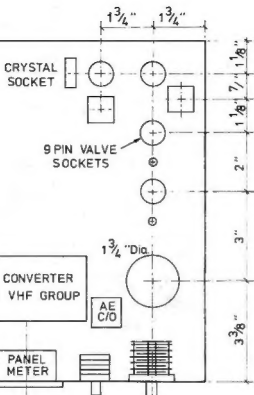
With the transceiver in tune position, it should be adjusted for maximum output at 28 MHz. Now with an absorption wavemeter near L2 adjust VC2 for maximum reading at 28 MHz; with the wavemeter at 144 and near L3, VC2 is adjusted for maximum; with the wavemeter near L5, VC3 is adjusted for maximum. With a wattmeter connected to the output of VC4, VC5 and the coupling and spacing of L7 and L8 should be adjusted for maximum RF output. Re-peck all adjustments for maximum power output at 144 MHz. With full carrier or tone the output should exceed 50 watts RMS. PA cathode current should peak at between 250 and 300 mA on speech peaks.



144 MHz SSB TRANSVERTER



(SIX METRE SECTION BUILT HERE)



Note. Chassis size $12'' \times 11 \frac{1}{2}'' \times 2 \frac{1}{2}''$

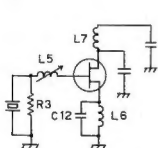
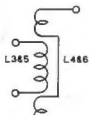


FIGURE 1 - ORIGINAL



L3 & L5 Each 4t 20 SWG
 $\frac{1}{2}''$ d. spaced by 1 wire d.
L4 & L6 Each 2x2t 20
SWG $\frac{1}{2}''$ diam.

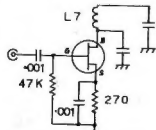
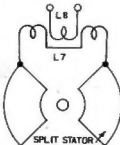


FIGURE 2 - MODIFIED



COIL DETAILS

RECEIVING SECTION

The receiving section uses a WIA VK3 VHF group 2 metre converter, modified for external oscillator injection.

While this is not strictly necessary, it is most desirable as it ensures that the transverter actually transmits and receives on the same frequency. It also saves the cost of one crystal, and gives the converter a little more oscillator injection, producing a slight improvement in performance. Fig 1 gives the original circuit, while Fig 2 shows the simple modification required.

The L6 coil form is replaced with a 270 ohm resistor in parallel with a 1000 pF ceramic capacitor, utilising the holes in the p-c board where the coil would go. The gata is added in place of L5, again using holes in the board. The co-ax, which comes from L11 comes through the side of the L11 can, across the chassis, and is soldered to the bottom of the converter, which is mounted on stand-offs above the main chassis.

The trimmer across the crystal should be adjusted to bring the transverter onto frequency. If a counter is not available, this can be done by firstly calibrating the transceiver at 28 MHz, then with the transceiver in the receive mode locate the 100 KHz calibrator harmonic at 144 MHz. It may be quite weak and it may be necessary to hang a wire near the 100 KHz oscillator with the other end in the converter input. Adjust the trimmer until the 28 MHz harmonic and the 144 MHz harmonic produce a zero beat (RX in AM position).

A possible improvement to the unit can be had by using a 38.666 MHz crystal in the oscillator and multiplying by 3 to produce 116 MHz. This will do away with a small problem encountered in the unit, that is 29 MHz $\times 4 = 116$ MHz, but 29 MHz $\times 5 = 145$ MHz. Very little of this fifth harmonic content actually gets to the antenna, mainly due to the cancellation in the mixer, but nevertheless it's a problem which can be eliminated before it starts by utilising a different crystal.

If a separate transmitter-receiver combination is to be used, the 28 MHz in and out relay can be omitted and two cables used, one for in and one for out. This can also be done with the FT200 if required, by feeding the low level output into the transmitting mixer, and the receiver mixer output into the normal antenna socket, thereby utilising the internal antenna change-over relay in the FT200.

USA Repeaters

It appears that repeaters in the 2m band are a big issue in the USA arising out of FCC Docket 18803 — briefly mentioned in QSP, Jan 73 A.R. — as reported by Wayne Green in QP Magazine for July 73 and elsewhere. As if the "apparently airline" FCC Regulations were insufficient to spark off vociferous complaints according to one report, yet another report mentioned the chief of the FCC division responsible for amateur operations as saying that in his view amateur radio was no longer justifying itself — espousal operators seemed to be in the overwhelming majority. One might be forgiven in asking if these are straws in the wind for the 1978 ITU WRA Conference.

SIDE BAND ELECTRONICS ENGINEERING

144-148MHz TWO METRE OPERATION EQUIPMENT

CLEGG FM 27-B USA 25 Watt output transceivers, continuous coverage, independent receiver & transmitter frequency controls, see MAY 73 QST for full report. 12-13V DC operation, with PTT microphone, if enough interest shown to place a large order, soon available for **\$350**—subject to by-law import privileges.

KEN PRODUCTS KP-202 with crystals for 4 channels, new repeater 1 and 4 frequencies available, full 2 Watt output, hand-held **\$150.00**

KEN chargers for NICAD batteries, **\$20.00**. NICAD Batteries **\$15.00** for 10h.

BELCOM LINER 2 20 Watt PEP solid state SSB transceivers, 12V DC **\$330.00**

SWAN TV-2C 144 transverters, 28MHz drive, 144MHz 240 Watt PEP output on SSB, 180W FM or AM/CW, receiver convertor with 3 FET's. **\$430.00**

SWAN VHF-150 144MHz linear amplifier, built-in 240V AC power supply, optional Class C or Class B operation, 150W carrier input. **\$375.00**

YAGI ANTENNAS, 9 element 10 ft boom, with gamma-match coax feeding **\$30.00**
Still attempting to procure 12V DC operation solid state 20 to 50 Watt automatic operation amplifiers.

MIDLAND PRODUCTS. Model 13-869 5W, 23 channel CB 27MHz 12V DC transceivers, all channels crystals provided, PTT mike **\$90.00**

Model 13-858 5 Watt AM 27-880 operation for marine use 12V DC, PTT mike, etc., included **\$75.00**

Model 13-700S one watt 2-channel walkie-talkies **\$40.00**

Model NC-310 1 watt 3-channel de luxe walkie-talkie **\$50.00**

Crystals for various 27 & 28MHz channels, per pair **\$3.00**

SWR Meters, 52 ohm, twin-meter type **\$16.00**

SWR Meters, single meter type, also FS Meter **\$12.00**

PTT hand-held dynamic 50k ohm microphones **\$19.00**

BARLOW-WADLEY XCR-30 Mark II continuous coverage 500kHz to 30MHz crystal receivers, perfect AM & SSB reception. **\$225.00**

ANTENNA ROTATORS CDR AR-22-R **\$40.00**

CDR HAM-m **\$130.00**

HY-GAIN 400 extra heavy duty roto-brake rotators, **\$185.00**

(All with control indicator units)

HY-GAIN ANTENNAS 14 AVQ/WB 10 to 40m verticals no guys 19' tall **\$45.00**

18 AVT/WB 10 to 80m verticals, no guys 23' tall **\$65.00**

TH3JR 10/15/20m junior 3el Yagi 12' boom 20 lbs **\$100.00**

TH3Mk3 10/15/20m senior 3el Yagi 14' boom 1kW **\$145.00**

TH6DXX 10/15/20m senior 6el Yagi 24' boom **\$175.00**

204-BA 20m 4el full size Yagi, 26' boom **\$155.00**

Mobile whip 108MHz up with magnetic hold base and 18 ft RG-58U cable and coax plug **\$18.00**

Same mobile whip but without magnetic base, with standard base and 12 ft coax cable and plug **\$9.00**

BN-88 baluns **\$18.00**. Locally produced balun **\$15.00**

POWER SUPPLIES, 240V AC to 12V DC 3 to 3.5 amp, regulated output overload protected **\$26.00**

POWER OUTPUT METERS
Galaxy RF-550A with 6 position coax switch **\$75.00**

SWAN WM-1500 4 ranges 5 to 1500 Watt **\$50.00**

YAESU MUSEN TRANSCEIVERS All still in short supply 1974 deliveries, with approved by-law import duties exemption, documentation will be handled for you with firm order, pre-payment and 3 photocopies of foolscap size amateur station license

FT/FP 200 combination **\$350.00**

FT DX 401 **\$490.00**

FT 101B **\$530.00**

FT 101 CW filters **\$30.00**

FT 400/560 CW filters **\$30.00**

FT 400/560 noise blankers **\$20.00**

FT 101 (older models) conversion kits **\$50.00**

FT 101 (older models) 160m kits **\$15.00**

FT 400/560/401 160m kits **\$10.00**

All prices quoted are net cash basis Springwood N.S.W., pre-paid with orders, sales tax included in all cases, subject to changes without prior notice. Freight, postage, now much dearer than before! Packing and insurance are extras, sorry, no terms, credit or C.O.D. Proprietor Arie Bles.

SIDE BAND ELECTRONICS ENGINEERING

P.O. BOX 23, SPRINGWOOD, N.S.W: Post Code 2777

TELEPHONE (STD 0471) 51-1394

Private address, 78 Chapman Parade, Faulconbridge, near Springwood & Norman Lindsay's Gallery

a Diplexer for the Discone

Tom Moffat VK3AQV

63 Doncaster East Road, Mitcham, 3122.

This article is a follow-up to the one on the DISCONE broad-band VHF antenna, published in *AR* of April 1973. The antenna can be used on all VHF bands from 52 to 432 MHz, but its biggest problem, as stated in the earlier article, was that "you can't listen on six while talking on two". After several months of frustration on changing co-ax connectors over every few minutes to try to keep an ear on both bands, it was decided to make a concentrated effort to use the Discone on both 6 and 2 metres at the same time.

It was found that it would receive well on both bands by feeding the six and two metre receivers from the one lead-in with a 'T' connector. But accidentally keying one transmitter surely would have caused embarrassment in the front end of the other receiver.

The first step was to design some kind of filtering system that would pass all the 6 metre energy to the Discone, and block it from the 2 metre receiver.

All that was hoped for at that stage was to prevent the blowing up of front ends when a transmitter was keyed.

As for cross-band duplex operation (talking on two while listening on six), everyone who heard of the idea said, "It'll never work, 6 metre signals will block the 2 metre receiver, and vice versa".

But you can never be sure of these things until you try them. That is what amateur radio is all about.

DEVELOPMENT:

The Diplexer, Model One, consisted of a series of pass and reject filters made of RG58 co-ax, and arranged in the configuration shown in the block diagram, Fig 1.

Each was a quarter stub, a quarter wavelength long, to present a very high impedance at the design frequency.

The 'pass' filters were connected across the line, to short everything but the resonant frequency to earth, while the 'reject' filters were connected in series with the line to present an open circuit at their resonant frequency (the unwanted frequency) and pass everything else with little attenuation.

In other words, a 6 metre signal fed into the 6 metre port would pass the 6 metre parallel stub as if it was not there, go through the 2 metre series stub resonant at 2 metres only, and on to the Discone and the 6 metre series stub. The 6 metre signal hitting the 6 metre series stub would see it as an open circuit, so all the energy would have to go to the Discone.

If any did manage to sneak through the 6 metre series stub, it would be shorted to earth when it hit the 2 metre parallel stub, before it could damage the 2 metre receiver.

The first part of this scheme worked quite well. Fifteen watts fed into the 6 metre port resulted in about 14½ watts at the Discone port, with only 100 milliwatts or so appearing at the 2 metre port and the rest probably dissipated in the dielectric of the stubs. At this stage it was possible to listen to a fairly strong 2 metre signal while the 6 metre transmitter was keyed, although commercial services came through the 2 metre receiver if no other signal was present.

Things were not so encouraging in the other direction. Fifteen watts of 2 metre energy into the 2 metre port resulted in about 3 watts at the Discone port, about 30 milliwatts at the 6 metre port, and an SWR at the 2 metre port of about 5 to 1. The reason for this became obvious after some concentrated thinking. A 6 metre shorted ¼ wave stub is very close to a ¼ wave stub on 2 metres, so 2 metre energy was also seeing a near open circuit.

So much for that idea.

Diplexer Model 2 was made up in a similar way but with RG8 cable instead of RG58.

It was hoped that the lower loss cable would provide higher Q stubs.

Since three times the 6 metre frequency, 52.525MHz, is 11.5MHz away from the 2 metre design frequency of 146MHz it was hoped the higher Q would provide some discrimination against the three-quarter wavelength effect.

But it was not much better, and the tuned stub idea was abandoned. In Diplexer Model 3 it was decided to try coils and capacitors in the same configuration as the stubs.

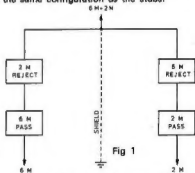


Fig 1

First tests on this circuit showed that the series rejection filters were good and sharp, and did their job well. And there was no more 2 metre reaction to 6 metre tuned circuits.

As for the parallel pass filters, they were not much good. Tuning them had little effect, and they showed a high SWR back to their sources. Obviously their Q was way too low.

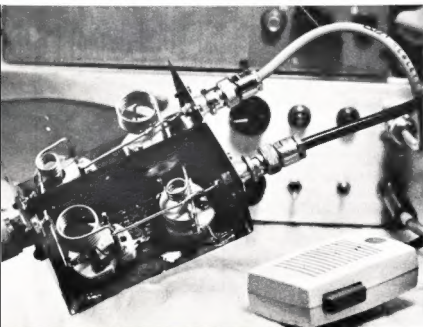
But when they were tapped down from the hot end, the tuning became much sharper, and the input SWR fell dramatically.

Model 3 was obviously going to be a winner.

After a bit of adjustment of the taps, the SWR dropped to 1 to 1 at the 2 metre port and 1.1 to 1 at the 6 metre port, and the power through to the Discone was pretty much the same as what went in.

As far as 6 metre energy at the 2 metre port, and 2 metre energy at the 6 metre port, both of these were too low to see even on a sensitive power meter.

And on the air, it was impossible to tell the Diplexer was in circuit. Both rigs worked as if they had separate antennas, well spaced apart.





RADIO SUPPLIERS

323 ELIZABETH STREET, MELBOURNE, VIC., 3000

Phones: 67-7329, 67-4286

All Mail to be addressed to above address

LAFAYETTE HA-800A SOLID STATE

GENERAL COVERAGE

- 5 BANDS 150-400 kHz, 550-1600 kHz (Broadcast band), 1.6-6.8 MHz, 4.5-14.6 MHz, 10.5-30 MHz
- Operates from 12 Volts DC (negative ground) or 220-240 Volts 50 Hz.
- Field Effect Transistors in RF Mixer and Oscillator Stages.
- Two Mechanical Filters for exceptional selectivity.
- Voltage Regulated with Zener Diodes.
- Product Detector for SSB/CW.
- Edge Illuminated Slide Rule Dial with "S" Meter.
- Continuous Electrical Bandspread Calibrated 80-100M Ammeter Bands.
- Variable BFO, Automatic Noise Limiter.
- Speaker Impedance: 4 to 16 ohms.

Price \$215.00

P & P \$2.00

Also available — HASCOB Ammeter Band 6 Bands 3.5MHz to 29.7MHz and 60-54MHz as above features with 100kHz calibration facility: \$218.00, 100kHz Xtal Extra \$10.75. P & P \$2.00

AS-100D/P



Battery: Internal Approx. size: 7 1/2" x 5 1/2" x 2 1/4"

Price \$34.50

High 100,000 ohm volt sensitivity on DC.
Mirror scale Protected movement.
AC/V: 6V, 30V, 120V, 300V, 600V, 1200V, (10,000 ohm/V)
DC/V: 3V, 12V, 60V, 120V, 300V, 600V, 1200V, 300mA, 12A
DC/A: 12uA, 5mA, 60mA, (100,000 ohm/V)
300mA, 12A
OHM: 2k ohm, 200k ohm, 20M ohm, 200M ohm
dB: -20 to +63dB
Audio Output: 6V, 30V, 120V, 300V, 600V, 1200V, AC

MODEL OL-64D/P MULTIMETER



Price \$19.75

Postage 30c

20,000 ohms per volt, DC volts: 0.025, 1, 10, 50, 250, 500, 1000 (at 20K ohm p.v.), 5000 (at 10K ohm p.v.), AC volts: 0-10, 50, 250, 1000 (at 1K ohm p.v.), DC current: 50uA, 1mA, 50mA, 500mA, 10 amps. Resistance: 0.4K, 400K, 4M, 40 megohms, DB scale—20 to plus 30 dB. Capacitance: 0.02uF to 0.02uF. Inductance: 0-5000H. Size: 5 1/2" x 4 1/8" x 1 1/4".

LAFAYETTE "GUARDIAN" 6600" 6-BAND RECEIVER



- Operates on 4 "C" Batteries for Portable use.
- Operates from 220-240 Volts AC with Built-in Transformer Supply for Home Use.
- 20 Transistors, 17 Diodes and 2 Thermistors.
- Slide-Rule Dial Calibrated for each Band plus Logging Scale for Reference Purposes.
- 6 BANDS
- (1) LONG WAVE — 160kHz to 300kHz
- (2) BROADCAST — 550kHz to 1600kHz
- (3) MARINE — 1.6MHz to 4.6MHz
- (4) VHF FM — 68MHz to 108MHz
- (5) VHF AIRCRAFT — 108MHz to 136MHz
- (6) VHF FM — 147MHz to 174MHz

Price \$175.00

TEST EQUIPMENT

MODEL C3023 TRANSISTOR CHECKER

This sensitive, low cost Transistor checker has facilities for measuring ALPHA, BETA and ICO factors, and for checking germanium and silicon diodes.

SPECIFICATIONS

Transistor Test Alpha 0.7—0.9967 Beta 0 — 300 ICO 0 — 50A: 0.5mA Diode Test: Forward and reverse internal resistance Resistance: 0 to 1M ohm. Dimensions: 7" x 4 1/2" x 2 1/4" 178 x 114 x 63 mm

SKYWATCH VHF AIRCRAFT BAND MONITOR B TRANSISTOR

Freq. Range: 108-136 MHz Circuit: Superhetrodyne Antenna: Telescopic Monopole Sensitivity: 10mV (Microvolt) S/N Ratio: 30dB I.F. Freq.: 10.7MHz Power Output: 200mW Pocket size 4 1/2" x 2 7/8" x 1 1/4" Complete with Earphone and Wrist Strap.

Price \$34.95. Post Free

GENERAL COVERAGE & AMATEUR COMMUNICATIONS RECEIVERS

- TRIO 9R-590S
- 4 Bands covering 540 Kcs to 30 Mcs.
- Two Mechanical Filters ensure maximum selectivity.
- Product detector for SSB reception.
- Automatic noise limiter.
- Large tuning and bandspread dials for accurate tuning.
- Calibrated electrical bandspread.
- "S" Meter and B.F.O.
- 2 Microvolt sensitivity for 10 db S/N ratio.

Price \$185.00

P & P \$2.00

A-10/P



Price \$55.00

Giant 6 1/2" Meter built-in signal injector. Overload Protected. AC/V: 2.5V, 10V, 50V, 250V, 500V, 1000V, (10,000 ohm/V) DC/V: 0.5V, 2.5V, 10V, 50V, 250V, 500V, 1000V at 30,000 ohm/V, 5000V, 10,000 ohm/V, 100,000 ohm/V, 1mA, 50mA, 250mA, 1A, 10A, 10A, 1A, 10A

OHMS: 10k ohm, 100k ohm, 1M ohm, 10M ohm, dB: -20 to +62db Signal Injector: Blocking oscillator circuit with a 5A102 transistor. Approx. size: 6 2/5" x 7 1/5" x 3 3/5"

SOLID STATE SINE SQUARE WAVE AUDIO SIGNAL GENERATOR



The AG-202 is a Wien bridge CR-type, sine & square wave audio signal generator which is invaluable for high fidelity analyses in the lab, on service benches and in electronic educational classrooms. All solid state in construction, it produces excellent sine waves instantly with a minimum of distortion and square waves with fast rise time that are ideal for hi-fi tests. Input for synchronization with external signal sources has been provided to further enhance the versatility of this fine instrument.

SPECIAL FEATURES

- Near-perfect sine waves, excellent square waves.
- Instant signals, superior stability due to all solid state circuitry. No warm-up waiting time needed.
- 10 V r.m.s. high level output at low impedance. Simple, easy attenuation control.
- Easy-to-read, single dial with frequency readings accurately calibrated in four ranges: smooth dial mechanism.
- Input provided for external signal sources, synchronization which produces signals of the highest accuracy.
- Frequency and output level of signals are practically unaffected by line and voltage fluctuations.
- Ideal for high fidelity analyses and test work. Also educational purposes.

Price:

Grand new Valves and Semiconductors.

2N 3055	\$2.00
OA91	15c
607 Valve	\$2.00
1T4—6C8	75c
1R5	75c
6BA6—6AK5—6V6G	\$1.00
2E26	\$3.00
6SJ7GT	\$1.50
Coil Formers 1 1/4 inch diameter, Octal base	45c

AVO Model 7 & 8 Multimeters. As new condition from \$35.00

VHF Transceiver TR 1935 (Suitable for 2 metres AM) 24 Volt \$28.00

Army Transceivers—We have just received a shipment of the most modern we have ever been able to offer. Complete with 24 Volt DC power supply, Leads and Ear Phones. All are continuous coverage, Manufactured by Plessey.

C13 1.00MHz - 12MHz FM AM \$65 In 12 bands each of 1MHz.

C42 36MHz - 60MHz FM \$65

B47 36MHz - 56MHz FM \$45

C11 TRANSMITTER 2MHz - 4MHz 4MHz - 8MHz, 8MHz - 16MHz. Continuous coverage with built-in Calibrator. Complete with 24 Volt Power Supply \$65.00

FREQUENCY METER Manufactured by American Disco-Wyne Model AM/URM 32A. 125kHz 1000MHz. AC Power Supply Head Phones and Calibration Charts \$130

HAM RADIO

(DISPOSAL BRANCH)

104 Hightest St., Richmond, Vic., 3121

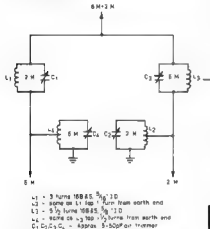
Phone 52-8136

CONSTRUCTION:

The final version of the Diplexer was built in a home-made brass box, with a brass shield separating the 2 and 6 metre sections.

Layout is exactly as shown in the block diagram, with the four tuning capacitors spaced evenly around the box. The coils are mounted directly above the capacitors, and the appropriate co-ax connectors are mounted in the ends. The box in use measures about 3 by 4 inches, but this was found to be a bit small. With the cover on the coils are too close to the sides, and their Q suffers.

The only way it will work properly is with the cover removed, and that is the way it is used to this day.



The tuning capacitors are not critical... we used some that happened to be on hand. Anything should work as long as they will resonate with the coils as specified, but make sure they have good ceramic insulation.

Remember, high Q is the secret to success in this circuit.

ADJUSTMENT:

Tuning the Diplexer is fairly simple. The first step is to terminate the Discone port in 50 ohms. Then feed a 2 metre signal into the 2 metre port and adjust C2 for minimum SWR with the detector connected between the transmitter and the 2 metre port. Next do the same with a 6 metre transmitter and the 6 metre port, adjusting C4.

Now feed 6 metres into the 6 metre port, leave the Discone port terminated, and connect a sensitive power meter to the 2 metre port. Adjust C3 for minimum indication.

Finally feed 2 metres into the 2 metre port, connect the power meter to the 6 metre port, and again go for minimum power, this time adjusting C1.

As the adjustments interact to a slight degree, they should all now be repeated, but this time with the Discone connected to the Discone port through the cable length normally used with it.

After the second run through you should not be able to measure any power from the 6 to 2 port, or the 2 to 6 port, and the input SWR for both should be very close to 1 to 1. If it's not, a slight adjustment of the tap on

the offending L2 or L4 should put things right.

As a "final-final" adjustment, for greatest 6 to 2 and 2 to 6 loss, terminate the Discone port in 50 ohms once again, and connect the Discone itself to the 2 metre port.

Now connect the 2 metre receiver to the 6 metre port and listen for a strong signal.

It will not sound strong going through the Diplexer in this way as it will probably be attenuated by at least 60dB. Once you hear something adjust C1 for minimum signal. You will probably be able to null it out completely by careful adjustment of C1.

This adjustment should be done sitting down, with both elbows on the table and both hands on the screwdriver. It is a very touchy one and the smallest rotation of the screw will take the test signal from full quieting to virtual absence.

Let it be stressed that a **STRONG** signal will be required for this test, as the loss when properly adjusted will be very high. Once the 2 metre reject filter has had this final touch up, you can switch things around and do the same on the 6 metre reject filter.

Once these adjustments are made, check and touch up if necessary the SWR readings into the 5 and 2 metre ports, with the Discone connected to the Discone port. They should require only a minor adjustment if any, and will not affect the tricky return loss adjustments just made.

PERFORMANCE:

Now you should be able to connect the Diplexer into the system permanently.

If it is working as it should, keying one transmitter should have no effect on the other receiver. If it does, connect the transmitter to the Discone direct, and terminate the other receiver in 50 Ohms. Chances are any noises you hear will occur just the same, without the Diplexer even being in circuit, due to some small spurious coming out of the transmitter.

A COUPLE OF FINAL POINTS:

You may find your 6 metre rig works better with the Diplexer than without it.

This is because the 50MHz Discone shows some reactance at the low end of its frequency range, causing an SWR of about 2% to 1 with a 52.525 signal.

The Diplexer seems to work as a sort of antenna tuner, improving the match between the transmitter and antenna at this frequency. The Discone article also stated that a band pass or low pass filter should be used between the transmitter and antenna, to prevent the radiation of harmonics.

The Diplexer serves very nicely as a band pass filter for both 2 and 6, as the parallel filters tend to block anything other than the desired frequency.

It seems likely that this design could be expanded to take in 432MHz, by adding the appropriate pass and reject tuned circuits. This would bring the total to nine, but it should work after a bit of development time.

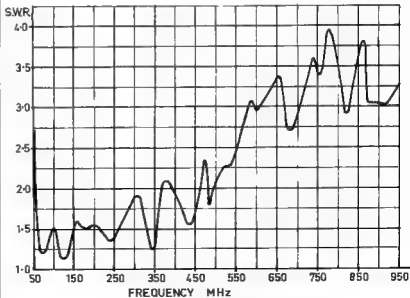
How about someone trying it?

discone antenna measurements

Ross Dannecker VK4ZFD/T

Kings College University of Queensland,

4057



ABOVE—A graph showing the comprehensive SWR measurements performed on a DISCONE antenna constructed from the article in April, 1972, AR.

vertical aerial needs no groundplane

BRIAN RICHARDSON VK4CCR
20 Peacock Street, Leichhardt, Q. 4305.

Mobile operation does not necessitate drilling the roof of the car to mount the usual quarter-or $\frac{1}{2}$ -wave whip. Here's how to avoid the problem and still get better than quarter-wave performance.

Of the various types of vertical antennas, so popular among VHF mobile operators, nearly all suffer from one big disadvantage; they require a good earth or counterpoise to decouple the RF current from the outer conductor of the coax feeder. Achieving this and involves drilling a disfiguring hole in the roof of the car, or carrying a bulky counterpoise with the portable station. There is, however, another version of the vertical, but one that is largely neglected today. This is the half-wave vertical, and it will provide 2dB of gain over the quarter-wave whip, without the need for a ground-plane. The end fed half-wave is fed at the point of minimum RF current, and so for practical purposes eliminates the need to decouple the coax outer conductor. It does however require a suitable matching network to match the low impedance coax to the high impedance antenna, and this is achieved by using a parallel tuned circuit to feed the antenna, and tapping the coax into the inductor. The inductor is a large diameter single turn, used to minimise coupling between the antenna and itself, the resonating capacitor is a ceramic variable. See Fig 1.

CONSTRUCTION

The antenna I constructed was a two-metre version of the half-wave, and is shown in the

accompanying diagrams. It used a 41 inch length of thin fibreglass fishing rod stock. A piece of coax braid was slid over the top of the rod for a length of 38 $\frac{1}{2}$ inches. The 2 $\frac{1}{2}$ inch diameter inductor was made up as in Fig 1, from $\frac{1}{2}$ inch wide copper strap, and soldered to the bottom of the braid. There is no reason why heavy copper wire such as 10 gauge should not be used here. The tuning capacitor, a tubular ceramic variable in my case, was soldered in parallel with the coil, and the outer conductor of the 50 ohm coax soldered to the bottom end of the coil. Determining the correct point for attaching the centre conductor is best done by the trial and error method, varying the tapping point on the coil for best SWR.

ADJUSTMENT

After the antenna is constructed attach the coax centre conductor initially about two inches from the earthy end of the coil, connect a SWR bridge into the feeder and feed a small amount of power into the antenna. Adjust the variable capacitor for best SWR, then move the position of the tapping point on the coil and re-measure the SWR after trimming the capacitor again. You will find very little interaction between these two adjustments and a good SWR can be obtained with a few minutes work. The antenna should be mounted several feet away from any large metal objects while carrying out these adjustments.

INSTALLATION

Once properly adjusted the antenna may be mounted on a wooden pole, clipped to the guttering of a car, or nearly anywhere, and the SWR will show only the slightest change. If a significant change in SWR occurs when a good earth is connected, then this indicates

To Antenna

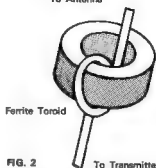


FIG. 2

To Transmitter

that there is coupling between the coax outer conductor and the antenna field. This is best remedied by running the feeder away at right angles to the antenna, or by looping the coax through a ferrite toroid about nine inches away from the antenna. See Fig 2. A suitable toroid would be the Q2 toroid advertised by the WIA disposals committee.

PERFORMANCE

I have made tests, comparing the quarter-wave whip mounted in the centre of the car roof, and the half-wave attached to a gutter mount. In all situations the half-wave gave considerably better performance than the quarter-wave, sometimes providing a solid signal where the short whip only picked up a weak fluttery signal. Tests made over about 10 miles between two hills, and using the receiver limiter current as an indication, gave results which indicated that the half-wave had slightly more than 2dB gain over the quarter-wave vertical.

The details given have only covered a 2-metre whip, but the same principles apply to any frequency. For example on 20 metres the coil would be about 25 inches diameter, of $\frac{1}{4}$ inch diameter tubing, tuning with a capacitor of 70 to 100pF.

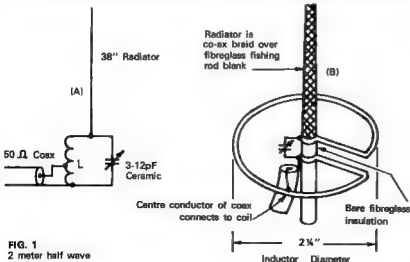


FIG. 1
2 metre half wave
vertical

1973 AUSTRALIAN RADIO AMATEUR CALL BOOK

- Obtain your copy from your Division, Bookseller or write to:—

'Magpubs', P.O. Box 150,
Toorak, Vic., 3142.

- Continuously up-dated through Bail's Inserts in AR—this service is available only to members.

\$1.20 plus 20c postage

looking back....

Fred M. Maddison

41 Khowles Street Amellia Heights Salscra. 6021

Looking back to 40 years ago the usual forms of entertainment for most young boys were the occasional slide-show at the local Church Hall and visits to a museum. Schooling consisted of the Three R's plus the practical subjects of woodwork and science.

To me, those science lessons were the only joy of my schooldays and, by a strange coincidence, those days on which science lessons occurred were the only days on which I did not develop a 'mysterious illness' or played truant. Fortunately, the science master had a greater interest in electrical other than chemical experimentation.

In common with most other children I caught the usual childhood ailments of chickenpox, measles etc. and then, at the tender age of seven, I contracted the dreaded 'Cat's Whisker' disease which has remained with me to this day.

In its mildest form this disease does not interfere with the normal smooth running of a household; however, in its more virulent form it tends to disrupt the harmony of the house. My collection of radio receivers and components - obtained through schoolboy 'swapping' sessions - was hoarded away in my small bedroom which I shared with two brothers. It was not long before it became somewhat difficult to open the door, let alone get into bed.

When one and two valve receivers first made their appearance on the market, mass unemployment caused them to be beyond the means of most people. Consequently the crystal receiver remained very much in vogue - although they too were quite expensive, being sold in beautifully polished cabinets resembling bead or trinket boxes.

With the upsurge of public interest in radio a great deal of home construction took place and occasionally the national newspapers printed circuit and construction details.

Circuits of early receivers were very basic and mostly consisted of an untapped coil tuned by a variable capacitor plus a crystal detector and a pair of high resistance headphones. Long aerials and good earths were the order of the day and even though Q factors were unheard of, this selectivity were of no concern because there were, from memory, only two broadcast stations in England.

In a very short time the theory and design of inductances improved dramatically. The most popular design was that in which taps from the inductance were brought out by brass studs which were, in turn, wiped with a knob-controlled arm. The detector, which used a germanium crystal, was contained in a dustproof glass tube.

The crystal was held in a little brass cup by three screws and this, in turn, was contacted

by a small piece of wire attached to a movable arm attached to the other end of the glass tube - hence the term 'cat's whisker'. The preference was for a gold wire cat's whisker which, incidentally, was in the shape of a small spring.

Considerable time could be spent in probing the surface of the crystal for the 'loudest' spot and even the vibrations of someone entering the room could break the long sought after 'loud spot' although it proved to be that the coiled shape of the cat's whisker was slightly effective in reducing the vibratory loss of contact. Sophistication came with the construction of two crystal detectors placed side by side - at least one was guaranteed not to lose reception!

Needless to say, broadcast stations were springing up all over the world and for those fortunate enough to be able to afford a valve receiver it was comparatively easy to receive stations such as Radio Paris. However, crystal receiver circuits were still being improved upon and I was fortunate enough to come across one which the designer boasted would receive Radio Paris.

Basically the inductance was a wire-wound tube approximately four inches in diameter inside which revolved a tennis ball which was also wound with wire. This was known, I believe, as a variometer. Imagine my delight when, on hooking it up, Radio Paris came through; in fact it was so loud that when I coupled it to a 2000 ohm Ormond horn speaker the volume was amazing. When my father brought in the next-door-neighbours to hear a French-speaking horn-amplified crystal receiver my face was like that of a Cheshire cat.

I clearly remember persuading my mother to buy toilet rolls in order that I had ready-made coil forms. The progression from newspaper to toilet rolls was appreciated by the anatomy and, coupled with the advancement of experimental radio, was no mean achievement.

However, not all of my ideas were

BELOW

Diode detectors have progressed a long way from the 'cat's whisker' detector.



beneficial to the household and encouraging pats on the back alternated with discouraging smacks on the behind. For example, having read that warming batteries rejuvenated spent cells, I once placed a large 120v HT battery in a warm oven and returned to experiments which I felt would benefit mankind. Some considerable time later acrid fumes pervaded the house and a quick visit to the oven revealed a mass of molten wax, pitch and carbon rods bubbling away in their now empty cells.

On another occasion, having constructed my first mains operated receiver (transformerless), I discovered that excellent results could be obtained by using the frame and springs of the bed as an aerial, not realizing that the whole frame was very much alive - a fact which my mother quickly discovered when she attempted to make the bed!

To this day I am still plagued with the 'cat's whisker melody' and, in the hope that I may be of some assistance to other radio enthusiasts who may be as yet unaware that they too are sufferers, I submit below my current (no pun intended) medical report.

Reference Patient RS-88

General, Physical and Mental Fitness:
Has a Split Sator personality. Has ability to climb ladders, masts and clamber about roofs but suffers severe headaches and giddiness when painting or cleaning windows while standing on even the smallest stepladder.

Manual Dexterity:

Has a watchmaker's skill when winding small coils or working on printed circuits but is all thumbs when washing up and drying crockery.

Prescribed Treatment:

Many years of massive doses of QRN and electric shock treatment have elicited little response and it is felt that the introduction to FT 101 may be the only cure. ●

how safe is your aerial

Chris de Combe VK5NQ

Flat 83 Bk G Carr war St-est Woomera 5720

As the last crash of thunder sent me leaping at least 6" out of bed and sent the cat dashing for cover I was suddenly struck by the thought 'How Safe is My Aerial'.

A good aerial represents a large surface of metal which is positioned clear of any other objects. As such it is a potential lightning hazard.

There are several methods of protecting an aerial system all of which depend upon DC earthing of the aerial. For this protection to work and also more important to be safe, the earth used must be good and on no account should mains earth be used. A 5 foot metal rod sunk into the ground represents a reasonable earth system.

The most simple way to earth an aerial is to install a switch at the point where the feeders enter the shack. When the aerial is not in use it is switched to earth. For coax feeders an earthed socket can be provided to terminate the aerial.



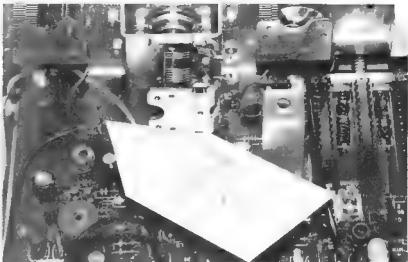
The aerial switch Fig 1 works very well provided the switch is a high quality knife type but it has the great drawback that it can be forgotten. In one case the shack is not protected and in the other the station transmitter can be fed into an open circuit with nasty results.

A better method is to use automatic protection, using RF chokes to earth the aerial to DC but not to RF.

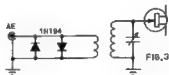
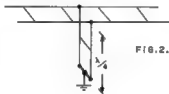
Suitable chokes should have a low DC resistance, that is wound with heavy gauge wire, and a reactance at least 5 times the line impedance.

BELOW

Chris VK5NQ operating his own rig at the Woomera Radio Club VK5WC.



ABOVE
Showing where the protective diodes were added to a Heathkit HW7.



Stations using a single bend can use $\frac{1}{4}$ wave stubs with good results. Fig 2. A $\frac{1}{4}$ wave length of line connected between the feeder and earth will provide a low resistance DC path and yet a very high impedance to the RF.

When using coax cable the velocity factor of the cable should be taken into account. The length of the line being $\frac{\lambda}{4} \times VF$ where VF is typically 0.6.

Lightning protection not only applies to aereals but also to towers and masts which should all be well earthed.

Care should be taken to ensure that a good connection is made to the tower and that the joint is weather proofed.

Lightning protection also gives protection against static build up which can be very high on dry days due to cloud movement.

It is not often appreciated that this static build up can be large enough to cause arcing and certain damage to transistor and FET receiver inputs if they are not properly protected.

The protection methods so far mentioned will protect the receiver but an additional protection in the shape of two 1N914 diodes connected across the receiver aerial terminals is worthwhile, Fig 3.

These diodes have a low capacity of about 4pF, so there is no effect to the receiver's performance but they have the effect of limiting the voltage across the aerial terminals to $\frac{1}{2}$ a volt.

The diodes will also help protect the receiver from any RF leakage across the aerial change over switch when transmitting.

Having just carried out several of these ideas I can now sleep easily through any storm knowing that my shack is safe and my receiver protected. I hope you can do the same.



For Best Value in SSB—Choose Yaesu from BAIL ELECTRONIC SERVICES



FL-2000B Linear Amp.
80-10 mx, G.G.



**SP-400
Speaker**



FRDX-400 Receiver
160-10 mx, WWV, C.B.



FLDX-400 Transmitter
80-10 mx, peak in. 300w.

FTDX-401 TRANSCEIVER: 80/10 mx, PA two x 6KD6, 580w. peak input SSB, choice of manual, PTT or VOX operation. Full coverage on 10 mx, offset tuning, calibrator. Includes fan, CW filter, noise blanker, \$550.

FV-401 EXTERNAL VFO: For FTDX-401, \$115.

FT-101B TRANSCEIVER: 160/10mx, SSB, AM, CW, PA two x 6JS6A, 300w. peak input SSB. Built-in dual AC/DC power supply. Low current drain transistorised except for transmitter driver and PA. Plug-in modules I.F. noise blanker, FET receiver RF, clarifier, built-in speaker. Ideal for portable/mobile from 12v. DC, or in the shack on AC, \$579

FV-101 EXTERNAL VFO: Matching auxiliary VFO for the FT-101, \$115.

FT-200 TRANSCEIVER: 80/10 mx, PA two x 6JS6A, 300w. peak input SSB. Manual, PTT or VOX control, offset tuning, calibrator. Operates from a separate power supply, \$331

FP-200: Yaesu AC Power Supply for FT-200, in matching cabinet with in-built speaker, \$90.

DC-200: Yaesu 12v. DC Power Supply for FT-200, complete with special plug and cable, \$135.

FT-75 TRANSCEIVER: SSB and CW. VFO, noise blanker, squelch. Very small size, transistorised, a superb little rig (see review "A.R." Sept. '72). Microphone and four crystals included, \$337.

FP-75 AC POWER SUPPLY: 230v., for FT-75. Built-in speaker, power cable and plug, \$49.90.

DC-75 DC POWER SUPPLY: 12v., for FT-75. Includes built-in speaker, mobile mount, power cable and plug, \$49.90.

FV-50C VFO: for FT-75, \$45.

FLDX-400 TRANSMITTER: 80/10 mx, PA two x 6JS6A, 300w. peak input SSB. Manual, PTT or VOX control, SSB, AM, CW. Adaptable to FSK for RTTY. Mechanical filter, \$436.

FRDX-400 RECEIVER: 160/10 mx. Mechanical filter, I.F. "T" notch rejection tuning, calibrator. Provision for installation of FET VHF converters, FM, and 600 Hz. mechanical filter for CW. Can be coupled with the FLDX-400 for transceiving, \$428.

FT-501 DIGITAL READ-OUT TRANSCEIVER: 80-10mx, SSB CW. 500w peak input, includes 2-speed cooling fan, noise blanker, clarifier, VOX and etc., \$760.

FP-501: Yaesu AC Power Supply for FT-501, in matching cabinet with built-in speaker, \$90.

FL-2000B LINEAR AMPLIFIER: 80-10 mx. Tubes, two x 572B triodes in G.G., twin fan cooled, \$396.

FL-2100 LINEAR AMPLIFIER: Similar to FL-2000B but styled to match FT-101, \$396.

FL-2500 LINEAR AMPLIFIER: 160/10 mx, four x 6KD6 tubes, standard cabinet, \$315.

FTV-650 SIX METRE TRANSDUCER: Converts 28 MHz. SSB to VHF, and includes receiving converter. Primarily designed for coupling with Yaesu models FL/FRDX-400, FTDX-401, FT-200, FT-101, with simple installation requirements, \$165.

FT-2FB TWO METRE FM TRANSCEIVER: 10w., fully solid state, with mic. and power cable, \$238.

FP-2AC AC POWER SUPPLY for FT-2FB, includes speaker and battery charger, \$59.

FT-2AUTO FM TRANSCEIVER: Similar to FT-2FB but with addition of automatic scanning facility, etc., \$345.

YC-35SD FREQUENCY COUNTER: 8-digit capability to 200 MHz, \$385.

FF-500X three-section LOW PASS FILTER for TVI reduction, \$22.

MATCHING EXTERNAL SPEAKERS for FTDX-401, FRDX-400 or FT-101, \$28.50.

YD-344 DESK MICROPHONE: Yaesu De Luxe PTT Dynamic type with stand, PTT switch, and PTT is actuated when lifted from desk, \$39.50.

DF-43B hand-held PTT DYNAMIC MICROPHONE, \$16.50.

Sets pre-sales checked, after-sales service, spares availability, and warranty.

All Prices include Sales Tax. Freight is extra.

Prices and specs. subject to change without notice.

BAIL ELECTRONIC SERVICES

QLD. MITCHELL RADIO CO., 59 Albion Road, Albion, 4010
N.S.W.. STEPHEN KUHLE, P.O. Box 56, Mascot, 2020

S.A.. FARMERS RADIO PTY. LTD., 257 Angus Street, Adelaide, 5000.
W.A.. H. R. PRIDE, 26 Lockhart Street, Como, 6152.

60 SHANNON STREET, BOX HILL NORTH,
VIC., 3129.

Telephone 89-2213

Ph: 57 6830
Ph: Day 687 1650
A.H.: 371 5445
Ph: 23 1268
Ph: 60 4379



NEWTRONICS

HUSTLER**Cush Craft****H.F. MONOBANDERS****HY GAIN**

204BA, 4 element 20m. Beam	\$165
203BA, 3 element 20m. Beam	\$153
402BA 2-element 40m. Beam	\$188

HF DUO BAND

DB-24B 4-element 20-40m. Beam	\$210
-------------------------------------	-------

H.F. TRIBAND BEAMS**HY GAIN**

TH5DXX, 6 element trap Beam	\$195
TH3MK3, 3 element trap Beam	\$165
TH3Jr, 3 element trap Beam	\$110
HY-QUAD 2-element Quad beam	\$153

H.F. VERTICALS**NEWTRONICS HUSTLER**

4BTV 40-10m. Trap Vertical	\$59.50
RM80 Adapter for 4BTV Converts the 4BTV to 80-10m. Vertical	\$20

HY GAIN

14AVQ, 10m. thru 40m. trap Vertical	\$57
18AVT, 10m. thru 80m. trap Vertical	\$79
12AVQ, 10m. thru 20m. trap Vertical	\$39

H.F. MOBILE WHIPS AND FITTINGS

HMM, mobile mast assembly	\$22.00
MC Series coil and adjustable tip rod assemblies:	

MC-75, 80m.	\$25	MC-15, 15m.	\$15.00
MC-40, 40m.	\$22	MC-11, 11m.	\$15.00
MC-20, 20m.	\$19.50	MC-10, 10m.	\$15.00

YAESU

RS Series Gutter Mount HF Centre Loaded Mobile Antennas, consisting of gutter mounting base attachment and mast with 11'6" co-ax. and plug PL 259 attached (base mast doubles as a 1/2 wave vertical on 2 mhz) and interchangeable coils with adjustable tip rods for 40 mhz to 10 mhz. 150 watt PEP, 4'6" total length. Slim and neat, brushed chrome finish, a typical Yaesu quality product. RS base and mast, \$19.50 Coils RSL 7 \$19.50, RSL-14 \$18.50, RSL-21 \$15.50, RSL-28 \$14.00.

ASAHI

AS-303A HF Mobile Antenna set, centre loaded type 3 5-28 MHz., 400w pep, consists of common mast 4'6", telescoping to 2'6" for convenient stowage, five interchangeable loading coils with tip rods, and adjusting spanners inc., making a total height of approx. 7', with h.d. spring and ball mount. Beautifully engineered, feeds direct with 50 ohm co-ax. The complete set a steal at \$90.

AS-NK matching s.s. Bumper Mount Adapter, for AS-303A, 1

MARK MOBILE**Helicat:**

HW-80, 80m.	\$25.00	HW-15, 15m.	\$20.00
HW-40, 40m.	\$23.50	HW-11, 11m.	\$20.00
HW-20, 20m.	\$21.50	HW-10, 10m.	\$20.00

FITTINGS. (Suit all makes)

BPR, bumper mount	\$12.50
BDYF, heavy duty adjustable body mount	\$12.50
HWM-1, fixed body mount	\$12.50
SPG, heavy duty spring	\$10
SPGM, light duty miniature spring	\$6.00
JMS "Jiffy" body mount	\$9

Asahi AS-KRB, flat roof mounting adapter for vertical trap antennas \$15.

V.H.F. ANTENNAS**HY GAIN**

23, 3 element 2m. Beam	\$15
28, 8 element 2m. Beam	\$29.50
SGP-2, 2m. ground-plane	\$14.50
GP-2, 2m. 1/2 wave ground-plane	\$25
GP-50, 25 thru 54 Mhz. ground-plane	\$25

CUSH CRAFT

AR-2, 2m. half-wave gamma loop matched vertical	\$25
A144-7, 7 element 2m. Beam	\$21
A144-11, 11 element 2m. Beam	\$29.50
A144-20T, 20 element 2m. "Twist" Beam	\$59.50

Also available, 27, 52 and 430 MHz Beams and Verticals

V.H.F. MOBILE ANTENNAS**HY GAIN**

MAG 1/2 wave similar to MAG 150 but with 1/2 wave Whip Complete with Co-Ax and Connector \$28.00
MAG 150, magnetic mount 1/2-wave whip (108 thru 450 Mhz.) includes 18 ft. of RG58U and connector \$22
W-102, 102" S.S. whip suitable 27-100 Mhz. \$13.50
764, duo-band 6-2m. whip \$38
HM28A, 2m. centre mount halo \$12
HMBA, telescoping mast for halo, and etc. \$12.50

ASAHI

AS-2HR, 1/2 wave S.S. 2m. gutter mount, inc. co-ax.	\$28
--	------

NEWTRONICS

UHG-1, 1/2-wave 2m. gutter mount, inc. co-ax.	\$16.50
--	---------

BALUN'S

A & R

351A, ferrite toroid Balun, 400w. PEP, 75U/300B	\$11.50
355C, ferrite toroid Balun, 400w. PEP, 52U/25U	\$15.50
353B, ferrite toroid Balun, 400w. PEP, 75U/75B	\$12.00

HY GAIN

BN-86, broad-band ferrite Balun, 2 kW for Beams and Doubles	\$22
--	------

ROTATORS

HY GAIN

400 Rotator, for the big beams and stacked arrays, 110v. AC	\$270
--	-------

CDR

HAM M, heavy duty Rotator, 220v. AC	\$138
Cable, 8-conductor, for Ham-M control	65 cents-yd
AR-22R low cost Rotator, 220v. AC	\$48

ANTENNA ACCESSORIES

HY GAIN

LA-1, Lightning Arrestor, for installation in standard 52 or 72 co- axial feedline, designed to Mil. specs.	\$29.90
LA-2, smaller size co-ax arrestor	\$8.75
C1, Centre Insulator, for Doubles	\$9.50

Q CRAFT

Porcelain Egg Insulators	15 cents
WIDE RANGE of Co-axial Cable and Connectors always in stock.	

K.W. ELECTRONICS

Multi-band dipole traps with ceramic "T" centre insulator, 80- 10m bands per pair complete with insulator	
Co-Axial cable switch 3 positions	\$17.50

BRW

Co-Axial Cable Switches 5 positions. Model 550G	\$21.50
--	---------

S.W.R. METERS AND DUMMY LOADS

Q CRAFT

SWF5-2, single meter type, combined SWR and FS meter, 50 ohms, inc. FS pick-up whip, size 5" x 2" x 2 1/4" 3-150 MHz UHF Connectors	\$14
SWR-2, dual meters, 50 ohms. Simultaneous reading of forward and reflected power, 5" x 2" x 2 1/4" 3-150 MHz UHF Connectors	\$20

OSKER

SWR-200 large dual meters, switched 50-75 ohms, with calibration chart for direct power readings to 2 kw. in three ranges. A very elegant instrument. 7 1/2" x 2 1/4" x 3 1/4"	\$37.50
--	---------

K.W. ELECTRONICS

Z Match Antenna Couplers, 80 metres to 10 metres. Rated at 1
kw. pep maximum with SWR less than 1.5:1, beautifully finished
in communication grey. See review "QST" July 1972:-

KW E-Zee Match, screw terminals at rear, size 5 1/2" x 6" x
12"

KW-107 Supermatch, as above but with addition of SWR
meter, power meter with large 50-ohm dummy load to read up to
1 kw pep, UHF sockets at rear. A superb piece of equipment, 7 1/2"
x 8" x 13"

KW-103 SWR POWER METER uses toroids, coil pick-up for
continuous operation 52 ohms 1 kW max to 30 MHz SO239 UHF
sockets

KW Dummy Load 52 ohm Air Cooled. Will handle up to 1 kW
(ideal for use in the workshop or field)

HEATH KIT
HN31 Cantenna Kit 1 kW oil cooled (oil not included) ..

\$28.00

OTHER ACCESSORIES

KATSUMI

EK-26 Electronic Keyer, a high quality job with 23 solid state
devices. Inc. paddle, and suitable for operation from 230v. AC or
12v. DC. Relay and transistor switching, built-in monitor osc.
and speaker. Surely the best value today in electronic keyers.
.....

AT-3 RF actuated CW Monitor and Code Practice Audio Osc.
uses 4 transistors, 2 diodes, with built-in speaker and tone
control.

Requires one UM3 penlite cell. In grey metal case, 2" x 3 1/4" x
3 1/4"

EKM-1 Audio Morse CP Osc with speaker, one transistor
headphone socket and tone control, requires one UM3 cell, in
black metal case 3 1/4" x 3 1/4" x 1 1/4"

AT-8 Audio Osc, larger de luxe type CP Audio Osc, 3 trans-
istors. Includes relay for transmitter keying if required, and
headphone socket. Tone and volume controls. Plenty of volume,
suitable for group practice or tests. Nicely finished brown metal
cabinet, 3 1/4" x 5" x 5". Requires four UM3 cells

\$30

KW
Monitorscope Model KW108 uses 3" square face CRO tube,
includes built in 2 tone test oscillator, sweep generator and AC
power supply. Convenient co-ax connectors at rear. A must for
the proper adjustment and continuous monitoring to keep your
SSB equipment operating at its maximum efficiency. \$159.00

.....

KW

Monitorscope Model KW108 uses 3" square face CRO tube,
includes built in 2 tone test oscillator, sweep generator and AC
power supply. Convenient co-ax connectors at rear. A must for
the proper adjustment and continuous monitoring to keep your
SSB equipment operating at its maximum efficiency. \$159.00

.....

MORSE KEYS

KATSUMI

MK-1 light weight Morse Key suitable for practice or trans-
mitter use

\$1.50

HI-MOUND

HK-70 De luxe heavy duty morse key. Heavy base. A really
beautifully constructed and finished precision unit. Fitted with
a dust cover, standard knob and knob plate

MK-701 Side Swiper key to actuate your Electronic keyer.

.....

BK-100 (8WG) Semi-automatic bug key, fully adjustable

BAIL ELECTRONICS HAVE AVAILABLE FROM STOCK

THE WIDEST RANGE OF AMATEUR ANTENNAS

AND ACCESSORIES IN AUSTRALIA

BAIL ELECTRONIC SERVICES

60 Shannon St., Box Hill North, Vic., 3129.

Q.L.D. MITCHELL RADIO CO., 98 Albion Road, Albion, 4019

N.S.W. STEPHEN KUH, P.O. Box 56, Mascot, 2020

S.A. FARMERS RADIO PTY LTD., 257 Angas Street, Adelaide, 5000.

W.A. H. R. PRICE, 26 Lockhart Street, Perth, 6152.

Ph. 57 0820

Ph. Day 887 1850

A.M. 371 5445

Ph. 23 1388

Ph. 60 4379

Ph. 89-2213

FT-101B

SOLID-STATE TRANSCEIVER

SOLID-STATE BREAK THROUGH

**10 FET's, 3 Integrated Circuits, 31 Silicon Transistors,
38 Silicon Diodes • Computer Type Plug-in Modules**

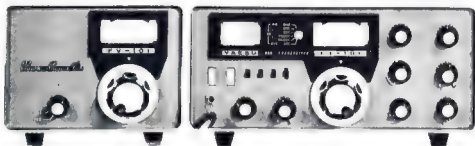
Portability demands light weight, small size, and power source flexibility. The FT-101B weighs 35 pounds complete with built-in 12 volt and 230 volt power supplies. Compact solid-state construction affords convenient transporting in over-night style luggage.

The FT-101B is not only designed for mobile or portable use, but excels as a primary base station. The transceiver features high receiver sensitivity and transmits power capable of driving the most powerful linear amplifiers available today.

The FT-101B is fully guaranteed for **90 Days** following date of sale, and continuing service is provided for your complete satisfaction.

The new model includes a built-in cooling fan.

All bands 160-10m, with plug-in noise blanker, and indicator lights for VFO and clarifier on



Maximum Input Power: 260 W PEP SSB, 100 w CW, 80 W AM

Sensitivity: 0.3 Microvolt for 10 db S/N

Selectivity: 2.4 KHz (6 db down), 4.2 KHz (60 db down)

*CW Filter — 0.6 KHz (6 db down), 1.2 KHz (60 db down)

Frequency Range: 3.5 to 4, 7 to 7.5, 10 to 10.5, 14 to 14.5,
21 to 21.5, 27 to 27.5, 28 to 30 (Megahertz) & 160M Band

Frequency Stability: Less than 100 Hz drift in any 30 minute period

Antenna Impedance: 50 to 100 ohms-SWR 2:1 or less

Audio Output: 3 watts, 350-2200 Hz, 4 Ohm impedance

Devices and Tubes: 10 FET's, 31 C, 31 Si Tr, 38 Si diodes
One 12BY7A driver, Two 6JS6A final amp

Power Source: 12 volts DC, or 100, 117, 200, 220, 234 volts AC

Power Consumption: AC, Receive 5 A, Transmit 3 A.
DC, Receive 5 A, Standby 5 A, Transmit 20 A Max

Dimensions: 13½" wide 6" high, 11½" deep

Weight: 35 pounds

FREQUENCY REJECTION STANDARDS

Carrier Suppression: 50 db down minimum

Unwanted Sideband: 50 db down minimum

Distortion products: 30 db down minimum

I.F. and Image Ratio: 50 db down minimum

FT-101 CHECK LIST

Built-in AC and DC power supplies

Built-in WWV 10 MHz band

Noise Blanker

25 and 100 KHz Calibrators

Built-in VOX

+5 KHz Clarifier

Break in CW with Side Tone

1 KHz Dial Read Out

Selectable SSB

AM Capability

Built-in Speaker

Microphone

Crystal Channels

Dual VFO Adapter

ACCESSORIES

External VFO Model FV-101

External Speaker Model SP-101

Mobile Mounting Bracket

*CW Filter (.6 KHz)

BAIL ELECTRONIC SERVICES

60 SHANNON STREET, BOX HILL NORTH, 3129

Ph. 99-3213

N.S.W. Rep.: STEPHEN KUHL, P.O. Box 56, Mascot, N.S.W., 2020. Telephone: Day 667-1650 (AH 371-5445)

South Aust. Rep. FARMERS RADIO PTY. LTD., 257 Angus St., Adelaide, S.A., 5000.

Western Aust. Rep.: R. R. PRIDE, 26 Lockhart Street, Como, W.A., 6152

Telephone 23-1268

Telephone 60-4379

las balsas

S. E. Molen VK2SG

The Australia Communications Co-ordinator
13 Pendle Way, Pendle Hill 2145

By the time you read this, you will have heard of Las Balsas, and of their epic trip across the Pacific Ocean. Three rafts and twelve persons braving the elements for long periods and landing at their destined point on the Australian coast. Of course you have also heard of the part that AMATEUR RADIO played during the trip. Amateurs all over the Pacific, the Americas and Australia combined to assist with the communications.

Just how does one become involved in something like this? What must one give to people who do this kind of thing? The only way that I can explain is to cast my mind back to 1970, when Vital Alzar made his first trip to Australia. At that time he used Amateur Radio as his communications. If one remembers, he did have difficulties with his transmitter, mainly that seawater seeped onto the audio board and ate the copper away, thereby preventing the audio getting to his transmitter. All that could be heard was the transient clicks as the press to talk button was pressed. It was about this time that I was asked to assist the Mexican stations with the communications. This proved successful and with the assistance of several other stations (who are again assisting) we finally managed to get the rafts ashore successfully at Mooloolaba in Queensland, despite certain doubts raised by some people in official positions.

On Vital's return to his home we had kept up an intermittent correspondence (I am a lousy letter writer) until October 1972 when I received the following letter. I quote in part:

"We are planning another expedition, with three rafts this time. They will be called 'Guayaquil', 'Aztlán' and 'Mooloolaba' in honor of Ecuador, Mexico and Australia. The name of the expedition itself is 'Los Huanacavillas', an Ecuadorian tribe which are thought to have been navigators who sailed in rafts across the ocean.

We will leave the first week of June (first Sunday) 1973 from Guayaquil. We will be in Ecuador the first week of

April building the rafts and hope to reach Mooloolaba again. We will be sailing together and I hope we will all reach Mooloolaba at the same time.

This time we will take a different route thereby definitely proving that the raft could have been a means of transportation in Precolonial times. This does not mean to say that I think people went from Ecuador to Australia. We will be twelve men with nine different nationalities, four men on each raft. The principal object of the voyage is to study how one can survive at sea, and the human element. We will also be conducting other manne experiments.

Syd, I wish that you could have the same network as you did on the previous voyage, and for you to be the 'bossman' as you were before. I will leave that to you to plan as I know you will. If you will contact XE1EB (Admiral Samuel Fernandez), XE1NF (Roberto (BOB) Romero) and XE1CI (Nelly and Marcos Lazard) and let them know the time and the frequency and the day, whenever you say they will be ready to listen. I do hope that it will be soon so that we can be in contact before the expedition starts.

Thank you very much for your trouble," etc

When one receives that kind of letter, what can one do? Well as you guessed I replied, and we set up a schedule with Nelly XE1CI on a fairly regular basis through January, February and March. Of course there was a lot of correspondence as well, for I wanted things like radar reflectors fitted and also some emergency radio equipment as carried in lifeboats, in addition to other gear that was felt necessary for safety of life at sea.

In the final consummation we agreed on some things, and disagreed on others, but in the main we compromised on what we felt would be best and most conveniently carried by the rafts, which you must realise would have to carry a fairly heavy load of food, water, equipment and personnel.

In April, Vital and the crew moved to Ecuador to start the building of the rafts, which were built of female balsas logs cut at the right time of the month, so that the logs are in their least absorbent condition. Strange to say the male logs are very hygroscopic and do not last any time in water. So female trees are used and these have proved very durable. The construction of the rafts, provisioning, and preparing took them well into May. The date for sailing was then set for the 27th May 1973, as the tides, current and winds appeared that they would all be favourable at that time.

During the time that Vital and the crews were constructing the rafts, Nelly XE1CI, Samuel and myself set about organising the necessary networks, in the Americas and under control of XE1CI were the following stations:

XE1CI, XE1EB, XE1NF, XE1TX, XE1FFC, HC2OM, W6FO and VE2BBS.

As for myself, my mind went back to 1970 and to the stations who had been the main standby's namely VK4LZ and ZL1RO. Both of these stations had given unlimited assistance previously and it was felt that they would again be able to provide qualified assistance due to their previous experience with this type of operation. There were other stations with whom I had had considerable contact over the years and who I had met personally on several occasions. I felt they would fall into the operation with ease, they were VK4GD and 9VIRA. There was also a station in the Cook Islands who was approached and who had signified his willingness to assist but, due to occupation commitments, was not able to assist at the appointed time. Luckily his place was ably taken by another station from the Cook Islands who did an excellent job. But more of that later as we approach the Cook Islands on the actual trip.

Basically that was the setup as the rafts left Guayaquil in Ecuador on the 27th May, 1973 at 1700 GMT. The rafts were towed to sea by an Ecuadorian Naval tug with the intention of injecting them into the Humboldt Current but due to the tow rope breaking just as they were entering the northward flow, they experienced some difficulty in remaining in the current. With the winds blowing from the south west they found themselves being blown back to the coast and finished up behind one of the coastal islands named Santa Glade. After some days struggling against adverse winds and currents, the Ecuadorian Navy sent another tug to tow them well out into the Humboldt Current and turn them loose.

During this time, the communications between the rafts, Mexico and Ecuador were excellent (with some QRM) but with Australia it was, to say the least, very difficult. However Nelly XE1CI who was the control station was passing all the information to me and the stations who were listening in Australia, so at all times we knew just where the 'boys' were and how they were faring.

From where they were finally turned loose in the Humboldt Current until they neared the Galapagos Islands, the trip was fairly uneventful, with winds never above force 5 and the waves never reaching more than 5 metres high. As the rafts passed the Galapagos Islands on the 11th June, it was hoped that they could receive some fresh fruit and vegetables and have a celebration, because this was their first big hurdle owing to the current flow around the islands, which could have taken them onto the islands and wrecked the whole trip. Unfortunately, the yacht that was to have met them had a faulty compass and could not find them and even had difficulty finding the sands on its return trip, so contact was not made and the rafts drifted on their lonely way.

It was not until the 6th July that they made physical contact with the outside world. The M.V. TEKOA appeared out of the predawn murk and almost passed them by, until the



rafts attracted their attention by firing rockets. To quote the captain of the TEKOA as reported in the Auckland Star on the 24th August, I quote

"He had the very odd experience of meeting three Konbiki type rafts in mid ocean, and their leader buying three cwt of groceries and wanting to pay for them in cash. He also said that to his mind such expeditions were crazy, but the leader of the expedition said 'nothing to it'."

Anyway, the skipper of the TEKOA gave them a present of 24 cans of beer before he went on his amazed way."

From this point longitude 104 degrees 25 minutes west 00 degrees 51 minutes south onto the Marquessa Islands they had a fairly smooth though slow trip. With, of course, the occasional storms which apparently were up to the usual Pacific standards of waves up to 10 metres high and winds up to force 7. It was during this period of travel that the two parrots they had on board decided that they could make better time on their own, so early one morning they took off and headed west. This was not the best direction for them to go, as the rafts at that time were about 1200 miles east of the Marquessa Islands, the nearest land in the direction the parrots were last seen heading. As it would take sustained flying and good navigation for these birds to reach the islands, it was generally felt that the birds would not make it.

When the rafts were about six days away from the Marquessa Islands I had a contact with the yacht "SEEKER" HP9XGB-MM, who enquired as to the position of the rafts. Bruce had been trying to follow the rafts, but radio conditions had not been good and he had missed hearing some of the skeds. The interesting thing is that he had passed within three degrees of the rafts as he sailed from the Galapagos Islands to the Marquessa Islands, and he was now at anchor in the Marquessa Islands. As the sked with the rafts was the next day, I invited him to be on frequency at sked time. The next day, the sked went as usual and, after the formal information had been passed, I called Vital and asked him if there was anything that he needed from the Marquessa Islands? Vital suggested that he would appreciate certain fresh fruit. At this point, I called HP9XGB-MM and introduced Vital to Bruce.

After primary discussion it was decided that a sked the next day would be advantageous and would give Vital a chance to get his grocery list ready. The next day the grocery list was passed to Bruce who did a marvelous job rounding up the necessary goods. But one thing had us wondering. After three repeats we were all sure the boys were

beginning to feel the strain of the trip. Vital had asked for 24 teaspoons!

It turned out that they had been teaching the monkey they had on the raft to eat with a spoon and he had responded marvelously. Unfortunately he was also lazy and did not like washing up. After he had finished his meal he would hurl the spoon into the sea and the rafts were now running very short of spoons.

Vital had also asked for a pair of dental pliers, for apparently one of the crew had tooth ache. It turned out that Bruce on the "SEEKER" had a doctor on board and he would be coming with them to meet the rafts. Contact with the rafts was made on the 20th August and the groceries were transferred in a most efficient manner. Bruce had three dingies on board, each one loaded with the stores for one raft. As he sailed past the raft he let the dingy go so that the raft could unload it without too much trouble. While this was going on the doctor was having a look at the condition of the crews and removing the offending tooth.

The crew of the rafts were very grateful to Bruce and his crew on the yacht for his effort. It will remain in their memories as one of the highlights of the trip. After several hours of enjoyable meeting the rafts sailed on and the yacht "SEEKER" returned to the Islands. I believe the people on the yacht were pleased to reach an anchorage because Bruce said it was very, very rough out there.

The course of the rafts took them north of the Society Islands and north of Bora Bora Island. It was between the Marquessa Islands and the Society Islands that they ran into a fairly heavy storm. Heavy enough to make the monkeys leave the deck and head up the mast to get out of the sea water that was flowing over the rafts. Apparently the rafts were pitching hard enough to shake both the monkeys off their grip on the mast and unfortunately both monkeys were lost during that night.

By this time several yachts had been alerted that the rafts were passing north of Bora Bora and from the indication we received it looked like the traffic in the area would be very heavy and could almost develop into a traffic jam. Unfortunately, the seas did not abate to any extent and it was only the larger vessels such as the "MAGIC DRAGON" VEOMCG MM with Dan as the skipper, and the official vessel of the Governor of the Society Islands (with the Governor on board) who managed to meet the rafts. The Governor had sailed up from Tahiti to meet the people on the rafts. The meeting went off very well, and I believe a good time was had by all. The alerting of the Governor as to the position of the rafts and their impending arrival near Bora Bora was ably handled by FOBAU who spent many thing hours on frequency assisting the rafts.

After leaving the Society Islands the seas became a little rougher and lifted to 10 to 11 metres. It was during a storm in this area that the Mooloolaba suffered a little damage to its sail which was repaired but caused trouble at a later date.

The intended track of the rafts took them through the Cook Islands and ZK1AA who had been on frequency for about the past

week found the rafts almost passing his doorstep. He also was able to assist with the communications and in turn alerted the Premier of the Cook Islands as to the rafts' position. The Premier in turn offered to assist in any way possible, but unfortunately an aircraft sent out to sight the rafts could not find them. No contact was made but the Premier did send the following message to the rafts.

"To the leader of the expedition Las Bajas. The Premier, Government and people of the Cook Islands convey their best wishes for the success of your journey. And the protection of Tangaroa as you all pass over our Pacific waters". (Tangaroa is the god of the sea in the Cook Islands)

After leaving the Cook Islands and heading for Tonga in what is purported to be deep water, according to all marine maps, the leading raft came to a grinding halt on a coral reef. Luckily it was only a small reef as the other two rafts who were within 1000 metres of this raft did not touch it. As it was unmarked on any marine map we have called it Las Bajas reef. The name has not been ratified as yet nor has the position been checked, but when it has and if the name is accepted, we will at least have a reef to remind us of this trip.

Later, during a storm that lasted for five days, the sail on the Mooloolaba, which had previously given trouble, came undone from its lashings and the raft fell behind the other two during the night. The raft was not sighted again for six days. Unfortunately the transmitter on the Mooloolaba was not operating so it was not possible to contact them and find out just how far astern they had fallen. But, we did know that Marc Modena the skipper of the raft had a short-wave radio on board and usually listened to the news services from Radio Australia. I approached Radio Australia and asked them to broadcast the position of the other rafts so that he may know in which direction they were travelling, and try to catch up with them. Six days later there was another storm (these storms seem to be a feature of the Pacific Ocean) and to repeat Vital's words "winds gusty to heavy force 7 to 9, sea moderate to rough, waves 10 to 12 metres high" when over the horizon came Marc, with repaired sail fully set and charging along, like an express train.

Again the rafts were together. It may seem strange that after having travelled in excess of 6000 miles across the ocean this was the first time that one of the rafts had been out of sight of the other two. However if one considers that they were all in the same current and in the same wind areas, and that the rafts do not have rudders to steer with, it is not hard to understand their togetherness.

From Tonga to south Fiji the seas remained rough and the yacht FREJA who had hoped to cross their path on its trip from Fiji to Auckland had to turn back because of the rough seas. I believe this is a well founded vessel with a very experienced crew, but on that day Vital said that the seas were moderate and the winds had dropped considerably and they were only force 5, I



suppose it is a matter of relativity as to how one assesses rough seas.

The course from south of Fiji to south of New Caledonia, was maintained in an almost due westerly direction, and as the winds dropped to a steady 15 to 20 knots and the seas abated to about 3 to 5 metres high, the speed of progress decreased slightly to about 150 miles every four days. On the sked of the 18th October the stations from Mexico were very weak, and I had to handle all the traffic to and from the rafts and pass it all back to Mexico.

It was during this sked that Len VK4GD broke in to ask a question. As Vital was hearing both Len and myself, I told Len to ask his question. It appeared that His Highness the Duke of Edinburgh (Prince Philip) would be in Townsville for the Youth Award presentations and had indicated his willingness to talk over the Townsville radio club station VK4TC. As Len is one of the officials of the Townsville Radio club, it was on his suggestion that the rafts be approached for the purpose. Vital was very excited at the suggestion and a sked was made for Tuesday 23rd October at 0600 GMT when His Highness would be there. Unfortunately the conditions were not the best on Tuesday. That, together with the number of stations that were jamming on the frequency, prevented a good contact between the rafts and the Townsville Radio Club. This was regretted but Vital on the raft felt that he had achieved something for the Radio Club, as he did talk to some of the members of the club while awaiting the arrival of His Highness.

Also when one considers that the weather out at sea, where the rafts were, was not really perfect, with heavy rain and 15 to 18 knot winds, it can be realised that Vital considered it an honour to have the opportunity to talk to His Highness the Duke of Edinburgh.

Letters to the Editor

Any opinion expressed under this heading is the usual opinion of the writer and does not necessarily coincide with that of the Publishers

Dear Sir,

I refer to the Sunday morning broadcast from VK3WJ on the 21st October, 1973 wherein listeners were invited to comment on your comprehensive report relating to Amateur Band Planning.

References were made to the forthcoming Colour Television transmissions with their obvious interference problems and we were also reminded of the ever-present threat of incursions into the amateur band allocations by commercial interests.

Almost every Sunday the Band reports for SWL's state that "nothing was heard on 10 metres". What kind of advertisement is that? One Decibel Seven megahertz and just because the Band is not open nobody is interested. How do you know any Band is open unless operators use it? Gentlemen, perhaps someone is very interested in some of that 1 MHz. I can understand why the VWA did not persist with their 10 metre campaign for novices following the last Easter conference.

The writer considers that a fresh submission should be made to the Post Office proposing that part of 10 metres be made available to the novice operators in lieu of the 11 metre segment stressing that this transposition is designed to minimise interference to the aeromodellers and radio paging systems used by the industries, Medical and Scientific services.

Of course there are several other reasons why the VWA should consider this proposal, the first being that at long last the 10 metre band would be in continual use

(and we would have that band report), secondly the low cost CB gear would easily convert and finally a good DX could be worked with the American amateurs who no longer have the 11 metre band.

As the Novice Licensing System is reviewable after 5 years it would be well worth the effort to avert any possible cause for criticism from the commercial operators and the relevant authorities. The writer is of the opinion that the most likely area for concern regarding the Novice License will be the 11 metre allocation.

Yours faithfully,
M. R. Morris.

20 Years Ago

with Ron Fisher VK3OM

DECEMBER 1953.

Amateur activities were obviously slowing down during December 1953. The Editorial page was devoted to a review of the year's events which included the United AOC and the privilege of sixteen year olds to sit for the amateur examination. On the Federal front, progress was reported on the preparation of the new Call Book with advertising copy rolling in. It was suggested that amateurs with a flair for design should submit ideas for the front cover.

DX highlights for December were that 2C3AA was operating from Christmas Island on phone and CW. 2C3AA was planning a DXpedition to Tokelau Island using the prefix 2M7. G2RO was intending to operate from Sarawak and Borneo and George VK3ADZ was on his way to Heard Island complete with 100 watt rig for 7 and 14MHz.

The list of Institute office bearers published at the head of the Federal and Divisional notes section makes interesting reading, the various presidents and secretaries were as follows: Federal G. Glover VK3AG and G. M. Hull VK3ZS. New South Wales: Jim Corbin VK2YX and D. H. Gulf VK2EO. Victoria: Gordon Dennis VK3TF and Col Gibson VK3FO. Queensland: A. Weddell VK4FT and V. P. Green VK4VS. South Australia: W. W. Parsons VK5PS and R. G. Harris VK5SR. Western Australia: G. A. Moss VK6GM and J. Mead VK6JL. Tasmania: L. E. Edwards VK7LE and F. J. Evans VK7J.

Technically the December issue started off with the S-N6 Cascade 2 Mers Pre-Amplifier. Reprinted from *Hem News* it described the development of a high performance 2 mers front-end using a 6BK7 cascade to a 6AK5. A noise figure of 5 to 6 dB was claimed which makes an interesting comparison with modern solid state RF amplifiers.

Part five of Amateur Television by E. Cornelius VK6EC. A summary of troubles experienced in a few sections was discussed plus a circuit of the Video Mixer Monitor.

Magazine Index

With Syd Clark, VK3AGC

HAM RADIO TV July 1973.

Low Scan TV Test Generator: Operational-Amplifier Relay for Motorola Receivers: Low-voltage Super-Regenerative Receiver for VHF: Importance of Standing Wave Ratios: Frequency Synthesizer for Two-Metre FM Transistor Curve Tracer: Designing Impedance Matching Systems: How to Compare the Efficiency of Linear Power Amplifiers: Ham Sweepstakes Winners.

QST August 1973.

The Micromountainer: Recycling Obsolete Gear: How to Solder (VK3ADH): The WB4VVF Accu-Key: Banning and Distance Calculations by Slight of Hand: The Rochester VHF Converter: Quality Recipe for a Portable Package: Another Look at Reflections: Charging Nicad Walkie-Talkie Batteries: Reviews: Heath HA 202, Hallicrafters FPM 300, MT-5 Morse-Tone Transmitter, Heath GR-10, How to Achieve an Improved DX Score: The Sixth Amateur Satellite: Planning for the Future.

QST September 1973.

A. Brite: Size Beam: A High-Performance Balanced Mixer for 120MHz: A New Band Solid State Amplifier: A DSP and CW QRP Transmitter: MOSFET Pre-amplifiers for 10, 6, and 2 Meters: A Medium Power

HF SSB CW Transmitter, Pt 3: A Packaged Keyer and FT Switch: Reviews: Heath HM-2103, E. F. Johnston 550 & 557.

RADIO COMMUNICATION August 1973.

The Piqueux: Tiling with the Stille Rotator: Intense Radio Aurora: An Integrated Circuit Speech Compressor.

RADIO COMMUNICATION September 1973.

Phase Locked VFO for 2M Transmitters: Equipment Review: The Trio Model TS515 SSB Transceiver.

73 Magazine August 1973.

Mono-Band Log-Periodic Antennas, Pt 1: An Acoustically Coupled Digital Keyed Squarer for Tone Burst Entry: Theory and Design of VHF & UHF Amplifiers Utilizing RF Power Transistors: The Amateurs Intercom: Novel 150W Antenna: A Basic Solid State Slow Scan Television Monitor: Low Cost Frequency Counter: VOM Design: Simple QRP Transmitter: The Numbers Game: Distribution of DXCC Holders: Solid State Exciter for 450MHz: Talk Power and FM.

BREAK-IN September 1973.

Antenna Safari on the Cheap: Yaseu Master FT101 on 5680kHz: A Versative in the Reflectorometer Wattmeter: Adventure into Solid-State Direct Conversion: Electronic Look: Mobile News July-August 1973 contains details of an "Automatic 80 Metre Mobile Antenna Tuning Unit".

Sundry other small journals such as "EBB", "Collector's Errata" & "Amateur Radio News Service Bulletin" come to hand quite regularly and although not reviewed, sometimes provide interesting reading.

Awards Column

with BR. AUSTIN VK5CA
P.O. Box 7A, Crafers, SA, 5152

Attributions to Listings of DXCC

Phone:	C.W.
VK4VX 303-304	VK3AHO 311-331
VK4FJ 290-314	VK4FJ 293-322
VK3JW 288-290	VK4VX 288-288
VK4RF 252-254	VK4KX 237-239
VK4C2 241-242	VK4RF 228-246
VK3SM 206-210	VK4JX 160-167
VK4KJ 196-200	
VK4VX 180-182	
VK4KX 5-5	
Oper:	
VK2VN 314-336	
VK4VX 309-312	
VK4FJ 303-328	
VK4RF 274-288	
VK4KX 281-283	
VK4JX 226-234	
New Member	
VK3Z2 100-100	

Would all applicants for awards please note that the postal registration fee is now 75c in addition to postage. An alternative to registration is to use certified mail, which costs 25c plus postage.

When forwarding cards for checking, please enclose sufficient stamps, postal orders etc. to cover the return by registered, certified or ordinary (air or surface) mail, whichever you prefer.

IGNITION INTERFERENCE

In the U.K., the Wireless Telegraphy Regs. require that combustion engines do not radiate electro-magnetic energy exceeding specified limits between the frequencies 40 to 70MHz. This has been recently extended from 40 to 250MHz according to Sept. 73 *Radio Communications*.

Callign Identification.

Radio Communications quotes the G licensing condition about identification by callign as "The callign . . . shall be sent for identification purposes at the beginning and at the end of each period of sending, and whenever the frequency is changed. When the period of use exceeds 15 minutes, the callign shall be repeated at the same manner at the commencement of each succeeding period of 15 minutes."

Newcomers Notebook

with Rodney Champness VK3UG

44 Rathmullen Rd., Boronia, Vic., 3155

Radio Construction Bits from Hardware Stores, etc.

Hardware stores and the like can be a ready supply of items adaptable for use in radio construction.

Jon VK8TU and Rex VK2YA have both been of considerable help this month in bringing to your notice items that can be used for other than their intended use.

I quote from Rex's letter —

"About your idea of using NON-RADIO bits and pieces for radio purposes. What about plastic pill bottles as coil formers — easily drilled and mounted on panels, bases, etc. Can be tied up to valve bases to make plug in coils, using some sort of strong adhesive. Also, can use as insulators for aerials by drilling the right holes and attaching the necessary wires.

The coloured tops of various kitchen-type containers have a wide range of applications. Some make "beaut" panel light bezels — reds, blues, whites, greens, etc. Also they can be persuaded to act as knobs and dials for tuning purposes. A bit of ingenuity can overcome the disadvantages of a three-eighths shaft and a plastic container-top with a half inch hole. Pad up the shaft diameter with insulating tape or Band-aids, or something similar, and use the strong adhesive to keep the cheap, home-made knob in place. There may be problems if you want to remove these but, as they cost nothing, nobody will be greatly upset if they have to be broken in the process. The tops of toothpaste holders — the large economy size — can be cut off to make a flanged type of control knob. You can even engrave or otherwise mark the flange to show numbers or whatever you want.

The plastic containers for Vitamin pills are good for storing nuts and bolts, solder lugs, small items. Simple projects involving small wooden boxes can be improved by sticking on a cover of cooking foil — look for all the world like "metal boxes". Cunning. Dressing up projects with "DYMO" labels is an old gag and the old-timers will need no advice on this. Radio clubs could buy "Dymo" machines from club funds and charge at least enough to show a profit when selling desired labels to Club members.

Front panels of various equipments dress up nicely with handles from the hardware store. Vents for metal boxes with heat-generating valves inside can be obtained in a wide range of sizes and shapes from the local hardware man.

Small rubber "feet" may be used to advantage on all boxed gear to prevent scratching the polished top of the dining room table. Looks a finished job, too. Chrome plated handles can be fixed to the topsides of metal or wooden boxes to facilitate the operation of moving gear from Point A to Point B.

Does anyone ever use "stand-off" insulators? Easy to make. Plastic pill container with screw-on lid. Drill hole in the dead centre of the bottom of the container and fit a terminal of suitable design. Screw or bolt the lid upside down in the desired location and then screw the terminal-bearing body of the container into the normal threads of the lid and lo, a stand-by terminal — for almost no price.

Supermarkets and chain stores offer a wide range of aluminium cake pans — some (the not-too-filmy types) being okay as chassis for a wide range of projects. Small transistor projects can be built in small rectangular plastic containers.

The good thing to do is to develop a specialised sense which can — with due experience — lead the newcomer to look at almost everything with the mental query: "How can I use that for some construction project?" I must admit to looking at small items like Kombi Vans as potential mobile radio centres with all sorts of series stuck hither and about.

Thank you Rex for all this information, I am sure that it will be of help to more than just our newcomers. Now to a couple of hints from Jon VK8TU.

"My transceiver required several extension shafts and I used lengths of brass welding rod, about 1/4" diameter. This may have some kind of gauge number, but I do not remember now as I bought it many years ago. Universal joints were used at the inner and the panel end passed through rubber grommets mounted on the aluminium panel. The rods were bought in lengths of about 1 yard. Been going for years now."

Thank you Jon for your tips.

Have you ever thought of using plastic drink straws for spaghetti. A more suitable item is the plastic tubing which is available in many colours from craft shops. The diameter of the tube available varies from about 1mm to 6 or 7mm. Laminex sheet makes a reasonable board for transistor projects, although not as neat as printed board. Does anyone else have ideas on what can be used for radio projects along the lines of the above? That's all for this month.

Try This

with Ron Cook VK3AFW
and Bill Rice VK3ABP

TUBE ADAPTER

To improve the performance of older receivers, it's often necessary to replace an octal tube with a 7-pin miniature. As shown in Fig. 1, an easy way to do this is to make an adapter from a 7-pin socket and a male multiwire connector.

Begin making the adapter by removing the grommet from the connector cap. Then determine if the miniature socket will fit flush with the top of the cap. In case it won't, increase the size of the hole with a small file. Next solder a 3-inch length of hookup wire to each pin of the miniature socket. Leave sufficient insulation on the wires so that crossing leads will not short. Insert the wires in the appropriate pins of the octal plug, and pull the wires taut. To complete the



Fig. 1—A miniature-tube adapter for an octal socket. adapter, solder the wires to the connector pins, and plug in the miniature tube. — Hank Van Hooser, W4DIJ

Reprinted from QST, February 1966
ting

TOOTHPASTE-TUBE CAP INSULATORS

TOOTHPASTE-tube caps are an excellent source of material for constructing feedthrough and stand-off insulators as illustrated in Fig. 2. The feedthrough in example A is made by mounting a toothpaste cap on each side of a metal plate and passing a threaded rod through both caps. A spacer of insulating material is mounted at the center of the rod to prevent accidental contact between the rod and the metal plate. The nylon wheel of a curtain runner is ideal for this purpose. In example B, the necessary hardware is bolted to the cap and the cap in turn glued to the plate.

A non-insulated stand-off is constructed by directly bolting the toothpaste cap to the plate as illustrated in example C. An insulated version is made by cementing a machine screw to the concave recess in the top of the cap and gluing

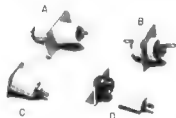


Fig. 2—Toothpaste cap feedthroughs and standoffs.

the cap to the plate. The cap can also be bolted to the plate as shown in example D.



Fig. 3—Feedthrough insulator made from the nylon wheels of a curtain runner.

Fig. 3 shows yet another method of constructing a feedthrough insulator. A small insulated washer, placed at the center of the assembly, prevents a short circuit between the rod and metal plate.

— D. P. Taylor, ez-GBOD

Reprinted from QST, May, 1966

Commercial Kinks

with Ron Fisher VK3OM

3 Fairview Ave., Glen Waverley, 3100

Over the period that I have been writing Commercial Kinks, several pieces of gear have stood out as top favourites by the number of enquiries received. Those that have so far been covered include several units from the Yaesu range, the Trio SR59, plus several other popular transceivers. Apart from these, the war time AR7 receiver rates very high on the enquiry list. Thousands of these receivers must have been released through disposals sources over the last twenty five years and it seems to be a surprising thing that many of these are still in original condition. As an aid to those who are lucky enough to own one of these, over the next few months I will present a run down on the set and then a few of the more popular modifications that have been proven over the years. Because of space limitations it will not be possible to publish the full circuit diagram but these will be available from Commercial Kinks in the usual way.

THE AR7 PART ONE

— description and specification.

Sensitivity. The absolute sensitivity is such that a radio frequency input of one microvolt modulated to a depth of 30 per cent at 400Hz applied through a standard dummy antenna gives an output greater than 50 milliwatts in the 600 ohm line with a signal to noise ratio of 1:1 in milliwatts or better. The specifications demand a minimum sensitivity of one microvolt absolute to give an output of six milliwatts under such conditions. Actually the output is as high as two hundred milliwatts on some bands. These readings are taken with the volume control adjusted to give a signal to noise ratio of 1:1 in watts.

Power Output. With the same input as above (1 microvolt) from a signal generator or antenna, and with the volume control advanced beyond the noise ratio of 1:1, maximum undistorted output to the speaker is nearly two watts. Output to the headphone jack is about 40dB below output level depending on the type of headphones used.

Image Ratio. Two stages of radio frequency amplification are used and these provide the following image attenuation 8MHz 50dB, 12MHz 40dB, 13MHz 54dB, 19MHz 35dB, 24MHz 26dB.

IF Selectivity. (1) Crystal in — Attenuation at 5kHz off resonance to be better than 50dB.

At 1kHz off resonance to be better than 26dB. Selectivity control at maximum. (2) Crystal out — Attenuation of at least 60dB at 3kHz off resonance

ANTENNA INPUT. The input to the antenna coil is designed for double or single wire input and has an average input impedance of 400 ohms. If a single wire it should be connected to terminal A1, a jumper wire being connected from earth to terminal A2.

COILS. The frequency range of the receiver is covered in five bands. The plug-in coil

units are lettered from A to E and cover as follows.

Band A	140 to 405kHz.
Band B	490 to 1430kHz.
Band C	1420kHz to 4.3MHz.
Band D	4.25MHz to 12.5MHz.
Band E	12.5MHz to 26MHz.

The electrical contacts on the coil acceptor unit are constructed of phosphor bronze silver plated and are self cleaning by friction.

Parallel trimming condensers are employed on bands A B C and D, and series capacity tuning on band E.

The main tuning of the receiver is accomplished by means of a four gang capacitor each section of which has a capacity of 11 to 240pF. The whole assembly is mounted on a 1/2 inch plate to ensure rigidity.

The oscillator coil is tuned 455kHz higher than the signal frequency and this is maintained over each band by correct adjustment of the inductance slug and padder capacitor mounted inside the coil shield. Band E has no padder or variable inductance. Correct tracking on this range is maintained by spacing the turns of the secondary winding during manufacture and adjusting C8 at the low frequency end of the band.

Crystal Filter. Continuously variable selectivity is possible by means of the front mounted control while the phasing control allows the rejection of any portion of either of the two sidebands. The rejection remains constant at any position of the selectivity control. The crystal is a special AT cut having a high Q and low drift. The resonant frequency of the crystal is 455kHz plus or minus 100Hz. The phasing capacitor is a different type, that is two capacitors in parallel with the variable plates common to both arranged in such a way that when the capacity of one section is increased, the other is decreased. This means that the total capacity remains constant and thus the resonant frequency of the associated IF transformer remains constant.

Next month full alignment procedure will be described and the following month details on how to modify the BFO to give reactance tube control for increased stability and also a Squelch circuit for use on net frequencies.

PROJECT AUSTRALIS

with David Hull VK3ZDH, Chairman, Project Australis.

SUMMARY OF AMSAT-OSCAR-B SPACECRAFT SYSTEM

1. AMSAT Deutschland Repeater (designed by Karl Meisner, DJ4ZC)
Input freq. passband between 432.125 and 432.175MHz
Output frequency passband between 145.975 and 145.925MHz
Power output (high power model) is 14W PEP
Downlink passband is inverted from uplink passband.
Repeater is 45 per cent efficient using envelope elimination and restoration technique.
Linear Operation — SSB and CW are preferred modes.
Repeater is commandable to either 3.75 or 14W PEP output.
Telemetry beacon at 145.980MHz (200mW).
2. AMSAT Two-to-Ten Meter Repeater (designed by Perry Kien K3JTE)
Input freq. passband between 145.85 and 145.95MHz

- Output freq. passband between 29.40 and 29.50 MHz
Power output is 2W PEP
Downlink passband is not inverted from uplink passband
Linear Operation — SSB and CW are preferred modes
Telemetry beacon at 29.50MHz (not same as OSCAR 61).
3. Morse Code Telemetry Encoder (designed by John Goodie, W5CAY)
24 analog input channels
Converts each analog value into a two-digit Morse code number or "word"
A third digit precedes the telemetry value and gives the line number in which the word is located.
Format is arranged 4 words per line, six lines per telemetry frame
Morse code rate is commandable to 10 w.p.m. or 20 w.p.m.
4. Teletype Telemetry Encoder (designed by Peter Hammer, VK3ZF and Edwin Schoell, VK3BDS)
24 analog input channels
Converts each analog channel to a three-digit number transmitted in Baudot code
Each three-digit value is preceded by its channel number making a five-digit telemetry word
The data is arranged 10 words per line by six lines or telemetry frame
Two lines of status information follow the analog matrix and give the spacecraft time line "n" "counts" from launch, 1 count = 96 minutes
Output keys 435.1MHz beacon in FSK 850Hz shift; 45.5 Baud; (reversed from U.S. standard). Also keys 145.85 and 29.50MHz beacons as AFSK, on command
5. 435.1MHz Beacon Transmitter (designed by Larry Kayser, VE3GB and Bob Pepper, VE2AO)
Beacon output freq. is 435.1MHz
Power output is 0.4W at an efficiency of 45 per cent.
Beacon is FSK modulated 850-Hz shift
6. 2304MHz Small Beacon Transmitter (designed by San Bernardino Microwave Society)
0.1W at 2304MHz
Turned on by command only for 30-min periods.
CW keyed — is followed by 30 sec. carrier. Also keyed with Morse code telemetry on command.
7. Codetone — Message store-and-forward system (built by John Goodie, W5CAY)
896 bit memory capacity using COS-MOS shift register memory
Loaded via command line
Output code speed is 13 w.p.m.
8. Experiment Control Logic (designed by Jan King, W3GEV)
Selects the spacecraft operating modes.
Protects satellite against excessive battery drain by reducing receiver output power or by shutting it off completely
9. Input Solar Power-Battery Charge Regulator (designed by Karl Meisner, DJ4ZC and Werner Hase, DJ4KJ)
Converts 6.4V at arrays to 14V to charge battery or to supply the spacecraft experiments.
Senses overcharge of battery and reduces charging current.
Senses failure of either of the two redundant regulators and switches to the opposite regulator automatically

AMSAT-OSCAR-B SPACECRAFT

A-O-B (to be known as OSCAR 7 after launch) is an international effort now involving four nations. The A-O-B systems developed in each country are as follows:

Germany:	AMSAT Deutschland Repeater, Spacecraft Structure, Battery Charge Regulator, 28V Power Regulator, Antenna System, DJ4ZC, DJ4KJ
Australia:	Two Redundant Command Decoders, Teletype Telemetry Encoder — VK3ZPL
Canada:	435.1MHz Beacon Transmitter VE3GB and VE2AO.
United States:	2M 10M Repeater, Morse Code Telemetry Encoder, Experiment Control Logic, Instrumentation Switching Regulator, Solar Panels, Battery — K3JTE, W3GEV, WA4DGL, W3JDTN, Marie Marr
Codetone —	W5CAY.
5 Band Beacon Transmitter	K8HLJ.

Dry batteries.

"Amateur Radio operators, especially those on 2 metre FM, are using more and more dry batteries than ever before. Zinc-carbon batteries are very high on the list because they are relatively inexpensive and easy to find, although some Amateurs use the more expensive but higher powered Alkaline-Manganese cell, and a few swear by rechargeable Nicads. A new dry battery, which will be on the market in the near future, just might revolutionise the whole field of portable dc power. (This is the) Lithium Organic cell which has been receiving enthusiastic reviews from the military.

Lithium batteries are lighter, have greater power output, can operate over wide temperature ranges and have a remarkably long shelf life - up to 20 years.

"A second look" by Jim Fisk in Ham Radio, July '73

Use or lose.

"What is the justification for allowing a group of individuals known as Radio Amateurs the exclusive use of large chunks of valuable radio spectrum space?"

The FCC in the Basis and Purpose Section of the Amateur rules mentions six things. They are -

The communication service that amateurs provide for the public (especially emergency communication).

The advancement of the radio art.

Advancing of technical skills.

Expansion of the reservoir of trained personnel.

The enhancement of international good will.

The advancing of communication skills.

Of the six the most neglected by amateurs is the advancement of skills for communicating.

(Guest edit at in CO July '73)

Can any other Division equal or better this?

VK8 Division now boasts two new call signs:

VK8ZHA and VK8ZDA - A father and son combination who both gained their calls at the same examination.

The long arm of coincidence stretches even further - both have the same "handle" - Adrian.

Just to keep the record straight, Adrian senior passed away before a PA call.

Well what about you other Divisions?

Ross VK8DA

IARU Region II

The 4th triennial Region II conference was held in Santiago, Chile from 28 to 30th April this year at which 9 countries were directly represented, 5 by proxy, 2 others were included in committee members without vote and also attended was Bob Denison, WODX the IARU President. A wide range of topics were discussed including IARU-MS, better band usage and a number of recommendations resulting from the Managua earthquakes.

MEMBERSHIP - ARRL

Interest in the Membership continues at a brisk pace. We are only a few away from having 25000 elected life members of the League, with about another 2500 paying on a quarterly basis. Handmade ceramic wall plaques will be mailed about mid June to those fifty or so members who have been members of the League for 50 years or more and who have already received the 50 year pin.

QST June '73

(The 1973 WIAA Convention directed that the question of exemption of suitable recognition to members of the WIAA for 50 years and over. Ed.)

COLOUR TV

Break-in for July '73 quotes a resolution passed at this year's NZART Conference as reading "That Council seeks from the NZ Post Office and NZ Standards Association an assurance that colour television sets, either manufactured locally or imported, shall conform in all respects to the standards laid down by the CCIR."

Reciprocal licensing

CSBDO forms a further future foreign amateurs operating temporarily in Switzerland will use their home call/HBB. Amateurs wishing to operate in HBB, Lichtenstein, should advise the Swiss Authorities at least 4-5 days in advance of their intention to operate in the Principality. They are instructed upon this since Switzerland is not part of Switzerland.

The Swiss only deal with radio licensing for administrative convenience.

ARMS Mobile News May '73.

Mobile DX

Ted M. Marks, W4ZFG receives our congratulations this month on getting his "140" sticker for his Mobile Century Award. His later additions were mostly on 15m 50W - ARMS Mobile News May '73. This award is similar to DXCC but in voice mode operating contacts. By the way a DXCC mobile-to-mobile award would appear to be possible although exceedingly difficult.

PRINCE PHILLIP VISITS TOWNSVILLE

Ross Melton VK4ZLC

On October 23rd H.R.H. Prince Philip visited Townsville to present the Duke of Edinburgh Awards.

The awards were presented to the recipients at Anzac Park on Townsville's Beautiful Strand. The Townsville Amateur Radio Club display shown in the photos was only one of many displays featured during the afternoon. The display included AR magazine covers, QSL cards and posters, and working models on amateur frequencies.

Using the FT101 Prince Philip was able to talk with the crew of the rafts of the Las Balsas expedition. The rafts were located at 170 degrees 59 minutes East, 24 degrees South when contacted. The antenna used was a TH3 JR erected on a 30 foot self supporting mast amongst the coconut palms at Anzac Park. About half a dozen Townsville amateurs spent many hours beforehand setting up the various pieces of equipment.

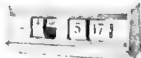
The display achieved its purpose in allowing Prince Philip to talk to Las Balsas as well as being a very interesting showpiece on the general public.

"He sounds like he's six feet under water", said the Duke of Edinburgh as he talked with Captain Alar. He went on to say, "Wish them the best of luck. Tell them I'm sorry I won't be there when they arrive."

Power was generated on site, and provision for a standby link on 7MHz was established with Les VK4LZ at Airline Beach. Fortunately 14MHz proved satisfactory with signals being R5 S8 during most of the afternoon.

COPAL-CASION 24-HOUR DIGITAL ELECTRIC CLOCKS

CLEARLY VISIBLE FIGURES
INSTANT READABILITY, ACCURATE



Model 601, A.C., The Popular One

A unique desk table calendar model, combining utility and beauty, receiving the Mamechi Industrial Design Award, Japan Digital two cord advanced date, day, hour and minute automatically. Anodised aluminium case houses built in neon lamp 230v 50 Hz A.C. Cord and plug attached.

Price \$25.00

Model 225, A.C., Economy Model

A desk/table clock of modern design. Colours, white and red. Built in neon lamp 230v 50 Hz. A.C. Cord and plug attached.

Price \$14.00

Model T-11, Battery

New Model, BATTERY POWERED, with alarm. Tuning fork controlled.

At last, a clock that will operate anywhere and does not clutter up the room with a cord. It is accurately controlled with a tuning fork operating at 400 Hz., running from a single torch cell which has a life of approx. one year. The alarm can be set 24 hours ahead. Push-button operated globe to illuminate face. Ultra modern cylindrical case, silver finish. 3 1/2 inch diam. x 8 1/2 inch.

Price \$35.50

Model 801 Wall Digital Clock

A large Wall Clock—

205mm x 174mm x 134mm

Colour, off-white, 230v AC 50Hz, 50mm high figures. Cord and plug attached.

Price \$55.

Caslon Clocks come from the world's largest and most advanced producer of Digital Clocks and Movements.

ALL PRICES INCLUDE SALES TAX

Post and Packing \$3.00

Bail Electronic Services

80 SHANNON ST., BOX HILL NTH., VIC., 3129

Phone 29-2213

TDK

RECORDING TAPES

WITH NEW ASTOUNDING

MATERIAL "MAGNETITE"

Available in all Reel-to-Reel & Cassette Footages

Write for Special Amateur Price List

This is the Recording Tape the World is talking about

WILLIAM WILLIS & Co. Pty. Ltd

Manufacturers and Importers

77 CANTERBURY RD., CANTERBURY VIC, 3126

Phone 835-0707

"BERU" (1973) Results World-wide

1st VE3HJM 4114 points
2nd VE2NV 3972 points
3rd 5V4KKL 3808 points
4th G3FXX 3579 points

Australia:

13th VK3XB 2930 points
18th VE2BPN 2768 points
21st VK5BV 2586 points
31st VK3ZC 1562 points
39th VK6RJ 1302 points
40th VK3KX 1295 points
41st VK2GW 1281 points
43rd VK3MR 1230 points
68th VK3RJ 380 points
72nd VK2VN 235 points

(Congratulations are offered to Ivor Staggard VK3XB on winning the "VK" silver medal, and to Ron Vaughan VK6RV on winning the bronze medal.)



ABOVE—
 Las VK4GD tells the rafts that Prince Phillip
 has arrived to inspect the TARC display.



ABOVE—
 Prince Phillip asks Las Balises "How's the
 weather out there?"



Ross Inglis operating VK4GD's FT101. Ross
 handled the Las Balises contact in the
 presence of Prince Phillip.



SCALAR

Amongst the comprehensive range of SCALAR ANTENNAS there are some of special interest to the Radio Amateur. (These include) our VHF & UHF, Citizens Band Range, HF Mobile and Base Station Units for Land & Marine applications, for example . . .

For more efficient 2-metre performance use the SCALAR M25. A 3dB gain mobile, designed for use in the 140-175 Mhz band. The antenna is a 5-8 wavelength whip complete with integral loading coil. Constructed of fibreglass these antennas combine resilience with non-ferrous continuity for high quality performance and noise free operation.

MODEL M25 AND SCALAR'S OWN

"MAGNABASE"

This high quality magnetic base may be fitted with any SCALAR whip. Instant installation on any flat metal surface. Fully protected for scratch free mounting. Complets with 12 feet of RG58CU coaxial cable.

MODEL MGB



SCALAR Industries Pty Ltd

Communication Antennas and
 RF Shielding Engineers

VIC 18 Shelley Ave., Kilsyth, 3137. Ph 725 9677.
 Cables, WELKIN
 NSW 20 The Strand Penshurst, 2222. Ph 570 1392.
 WA, Allcom Pty. Ltd., Phone: 57 1555.
 SA: Rogers Electronics. Phone: 264 3296.
 QLD Warburton Franki (Bne.) Pty Ltd Ph 52 7255

BOOKS OF INTEREST FOR AMATEUR OPERATORS

- | | |
|---|--------|
| ● NEWNES—RADIO ENGINEER'S POCKET BOOK | \$4.25 |
| ● SIMON—104 HAM RADIO PROJECTS FOR NOVICE & TECHNICIAN | \$4.25 |
| ● 73—SLOW SCAN TELEVISION HANDBOOK | \$5.75 |
| ● G.E.—ELECTRONICS EXPERIMENTERS CIRCUIT MANUAL | \$4.00 |
| ● R.S.G.B.—TELEVISION INTERFERENCE MANUAL | \$2.95 |
| ● AUST HI-FI STEREO BUYER'S GUIDE, SPEAKERS—NO. 2 | .60c |
| ● SIMS—PRINCIPLES OF PAL COLOUR TELEVISION | \$3.80 |
| ● SCHULTZ—UNDERSTANDING AND USING RADIO COMMUNICATIONS RECEIVERS | \$4.25 |
| ● MIDDLETON—TAPE RECORDER SERVICING GUIDE | \$5.95 |
| ● ELEC AUST—BASIC ELECTRONICS, 4th Edition | \$2.30 |
| ● ELCOMA—TRANSISTOR INTERCHANGABILITY GUIDE, 1973
(Japanese to "Miniwatt" types) | \$1.00 |

Add Postages: Local 45 cents, Interstate 75 cents

McGILL'S AUTHORISED NEWSAGENCY

Established 1860

187-193 ELIZABETH STREET, MELBOURNE, VIC., 3000

"The G.P.O. is opposite"

Phones 60-1475-6-7

For More Efficient... TRANSMISSION and RECEPTION install a **Stolle** Antenna-Rotator

An unrivalled aerial rotating system for TV or Amateur Radio antennas. With a **STOLLE Automatic Aerial Rotator**, accurate and positive antenna positioning in any direction, is right at your fingertips. This allows you to beam your antenna (for transmission or reception) by simply turning the control knob to the desired position, with a full 360° coverage. A STOLLE rotator is rugged

enough to handle the weight and wind load requirements of ham antennas up to the size of a normal 3-element 20-metre beam. It can operate for sustained periods of time without thermal overload . . . and with absolute synchronization. Positive disc brake on motor prevents "overshoot". A five-core cable is available to connect rotor to control unit.

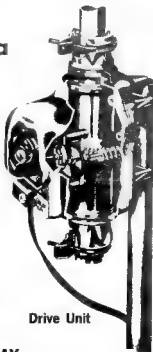
R.H. Cunningham
Pty Ltd

VIC: 493 499 Victoria St., West Mel
bourne 3003 329 9633 N.S.W. 64
Afred St. Milsons Point 2061 929 8066
W.A.: 65 Balcombe Way, Balga, Perth
8061 49 4919 Qld: L E BOUGHEN &
CO 30 Grimes St., Auchenflower 4066
70 8097 TELEX Melb 31447 Sydney 21707

Control Unit



Drive Unit



Install a STOLLE Rotator TODAY

with Eric Jamieson VK5LP

Formation, S.A. 5233
Times, GMT

For those with 80 metre facilities, Stan mentions the continuing Thursday night sked with Geoff VK3AMK on 3643kHz at 2000, and fairly regular visitors have been David VK3ANP and Mike VK2AM.

STATE OF THE ART CONTEST

The VHF contest averaged by 6UP Magazine in Sydney, under the auspices of Rod VK2ZJQ. Contest Manager, resulted in a win for contest stalwart VK5 knw. Wally VK5ZWV, who scored 31095 points from 46 contacts, all on 52 MHz, using meteor and other type scatter contacts, all from around 0530 EST, and embracing 20 such mornings of activity. The early mornings Wally did not appear in the log were 25th July and the 2nd August. That's a pretty good effort Wally, and the VHF fraternity offers their congratulations to you. Second place to Allan VK3TV with 23738 points and 90 contacts.

The best distances covered by this mid-winter contest were 52MHz: Welly VK5ZWW to Barry VK2 ZAY 763 miles, 144MHz: David VK3ANP to Mike VK3ASO 190 miles; Geoff VK3AKM to VK3BEH 188 miles; Allan VK3TV Stephen VK3ZAZ to Chris VK5MC 186 miles; 432MHz: Byron VK3YFL to Les VK3ZBJ 80 miles; 1296MHz: David VK3AUU to Les VK3ZBJ 30 miles. David used 0.2 watts on 1296

Thanks to GUP magazine for the above information, and for advice that there will be a similar such contest in 1974, dates to be decided when the 1974 IGY calendar is available for M-S data.

1.250 MHz H₂O

Thanks to the Victorian VHFer for the following,
headed 500 Watts DC Input.

Perfectly legitimate... but, you must have a special permit to make use of all these electronic.

This is the factual situation at the QTH of Ron, VK3AKC, in Geelong who has already done a mountain of experimenting on 1296MHz, and much valuable work on all the VHF bands.

The recently acquired high power permit by Ron must be renewed every 12 months and can only be used for EME experiments under the supervision of the PMG Department. . . the dish reflector must be no less than 10 degrees of elevation and this calls for a very high standard of workmanship to maintain the mechanical stability necessary under all types of weather conditions. . . the 20 foot diameter dish was entirely constructed by Ron in conjunction with commendable aid from his wife on computations for the project.

Besides numerous verifications via EML Ron's recent endeavours procured for him confirmation from NRL (Naval Research Laboratory, USA) - in the form of a tape, and OSI card, of his correct status during their 50th Anniversary Contest, also a very nice Certificate for his efforts.

Getting your feet wet at 1296MHz tropospheric-wise is not so difficult these days with the abundance of solid state devices available, but inter-continental contacts via Moonbounce can only be described as an undoubted dedicated effort . . . to those engaged in this field of amateur activities may go the rich rewards in human satisfaction. Good work Ron.

VIEWOWN to OSCAR 5

Wally, VK5ZWW, has taken time off from working M-S to write me a short note, and I need only quote:

With my transmissions through Oscar 6, so far I have worked ZL's 2, 3 and 4, VK's 2, 3, 5, 6 and 7. The transmitter has a 3-12 in the line with a measured output of 3 watts PEP into a 1/2 wave whip mounted on the shack roof. On the receiving side I use an unmodified Drake 2B and a half wave dipole.

Have heard many other signals including the exotic ones from the equator but am afraid the QRP is not good enough. Because of this QRP the satellite is only available for a period of about 5 minutes at the centre of a 20 minute

Hope to be running RTTY through Oscar and also RTTY is available on 62MHz already. Thanks for the news Wally, please write again.

Zm in G-Land

It seems to us that the 2m band is becoming far too mode conscious, with SSB operators who only ever

work SSB stations, FM-ers who only ever listen on their own channel and AM and FM stations who cannot receive SSB anyway (G3FPK in Mobile News Sep. '73 editorial).

It bothers me that the two metre band seems to be degenerating into just a few fixed channels, i.e. 559, FM talk box channels and now repeaters. It seems that if we are not careful, the 2MHz wide band which we now have will be taken from us and we will be allowed only certain fixed channels (G8CZM-M writing in the same crisis).

French Transponders

"Anjou" and "Mirabel" 70cm uplink 2m downlink transponders are part of balloon experiments being carried out in France. The packages are built for 60,000 to 80,000 feet, stay there about 2 hours and fall under parachute. During recent flights contacts through the transponders were made by G to DE and F to GH. The *Mobile News* (Sep. '73) article ended "After all it is like using a repeater on a 15 mile high tower."

GENERAL NEWS

A new beacon in Kalgoorlie, with the call sign VK6RTU, is awaiting a licence from the PMG, and plans to run about 40 watts FSK. Ray VK3ATN now using 56 elements on 144MHz with successful contacts to VK2SW in Wiggins. On a Sunday morning recently a rare sight was witnessed when a 35 foot steel tower was transported from Port Sorell to East Devonport on top of a Holden Station Sedan! Not content with that, the truck was driven to the station.

content with it, the tower was lifted over the top of the house and now rests in the back yard of Graham VK7ZAD (From ORM, Launceston). VK4TC, the Townsville Amateur Radio Club station should have a 6 metre base station soon - a transceiver donated by Rod VK4ZRC is being converted by Bob VK4ZRG (Backscatter, Townsville). . . . VK9CZ on Willis Island will be carrying out ATV skeds before long on 432MHz.

During a recent visit, VK6 Rod Graham VK2ZJZ visited Don VK6HK, who is one of the three southern hemisphere control stations for Oscar 8. Rod reports the teleprinter for Oscar 7 was already installed. The antenna system at 6HK is steerable from the shack in azimuth and elevation. The 144MHz aerial was 2 bays of 10 element crossed yagis and it was possible to shack select in real time vertical, horizontal, RH circular or LH circular polarization. The 432 array (for the now defunct 435 MHz beacon) had many elements but was steerable in azimuth only. Assorted antennas for 29.5MHz and other HF bands, and something like 18 coaxial cables coming into the shack from the antenna installation. The transmitter ran a pair of 4CX360s (8 U, October).

That will have to do for this time. Hope to see or hear all my friends on VHF this DX session. I will be running SSB on both 8 and 2 metres. **AND PLEASE SEND IN YOUR ROSS HULL LOG THIS YEAR!** Closing with the thought for the month "Most families do not worry about the wolf at the door any more. They just feed him on instalments."

The Voice in the Hills

Key Section

with Deane Blackman VK3TX

Box 382, Clayton, Vic., 3168

My apologies to regular readers of this column for its absence over the past few months. It is much easier to write when I get on the air and "talk" to people, but I am sure some beside me find that work keeps getting in the way of Amateur Radio.

Tom Clarkson, ZL2AZ, drew my attention to an article he wrote in April 73 "Break In" discussing the refusal of CW to lie down and die in the face of phone activity. As you might expect from the man who represented you at the recent ITU Conference it has a good deal of sound stuff in it.

The President's Cup has come back from the sweaters looking very fine and sherry. The winner will be known when the results of the VK Z1 become available; the formula was published in AR in August 1972. The formula includes a strong contribution from the results of the Ross Hull VHF contest, which begins this month. The Key Section had the CW part of this contest restored, can I again encourage you to support the Ross Hull? You thereby support CW, and the field, on 1972 3 anniversary, was pretty small.

This month also brings the festive season, and the thoughts of summer holidays. Let me wish you the compliments appropriate for the 25th, and remind you not to forget to pack your key when you go away. ●

VX0	52 180	VK0VF	Macquarie Island
	53 100	VK0MA	Mawson
	53 200	VK0GR	Casey
VK2	144 700	VK2JF	Durant
VK3	144 700	VK3JF	Edmont
VK4	52 800	VK4M1	2 Townsville
	144 400	VK4V1	1 Mt Mowbrall
VK5	53 000	VK5VF	Mt Lofy
	144 500	VK5VF	1 Mt Lofy
VK6	52 000	VK6VF	VK6RTT Bickley
	52 900	VK6RTT	Carnarvon
	144 500	VK6RTT	Albany
	145 000	VK6VF	VK6RTT Bickley
VK7	144 500	VK7JF	2 Darwin
VK8	52 200	VK8VF	Darwin
ZL1	145 100	ZL1VHF	Auckland
ZL2	146 200	ZL2VHF	Wellington
ZL3	145 250	ZL3VHF	Palmerston North
ZL4	145 250	ZL4VHF	Christchurch
ZL5	146 400	ZL5VHF	Queenstown
JA	52 500	JA1JVF	Japan
HL	50 100	HL1JV	South Korea
	52 010		
KH	50 100	KH5KH	Marshall Islands
KH6	50 104	KH6QJ	Hawaii

Various other beacons and television VHF frequencies were listed last month, and these should be referred to for a complete list. From very scanty information available it appears some of the Australian beacons are not operational at the time of preparation of this issue. It is hoped that the Australian authorities responsible to expect that most areas would have their beacons on the air for the VHF DX season. VK7RTZ is off the air whilst a new site is being VK4W1/2 at Townsville has also been off for some time but hopes to be back before long. The VK2WJ beacon has been off for some months, and unless something is salvaged pretty soon, it may be a long time before the use of the new 6 and 2 metre beacons prepared by Raper VK2ZNR, little will be heard from there. Things are a bit up in the air in VK6 as well, it appears the 2 metre beacon in Perth has not been operational for some time, I just wonder how all these various problems are to be solved, and whether they can be by the time you read this. Anyhow, it is hoped that the Australian DXers only critics on the cross-view, months afterwards.

ROSE HULL CONTEST

Once again a reminder that the Ross Hall Memorial Contest will be with us again from 7th December to 20th January 1974. As always there will be plenty of participation and it is to be hoped all have a very pleasant time. But do remember the poor Federal Contest Manager who wants you to send in your logs please. The contest for some time has had a very poor return of logs. Can we do better this year?

NEW ZEALAND FILM NEW ZEALAND

Stan ZL4MB, in Dunedin, has written to fill VK in on the present state of the art in ZL4. Stan is hoping for a better DX season this year. Commenting on last year, he mentions conditions were dead over Christmas and New Year. Best day was 11th February when he worked VK1JC-VK1ZPB at mid-day, VK5ZWW at 1320 and VK3ZGP at 1643.

Hugh, ZL2AID has improved his gear for this season, now VFO control and 150W PEP SSB as well as a unit for his car. Paul, ZL1QI is up to 30 watts PEP. Brian, ZL1AVZ, Bill ZL3QK, Max ZL3AAN are all expected to be operational.

Stan advises he will be home for lunch practically every day and will be listening 1215 to 1250 EDT each week day from 1st December, with either 100 watts AM or 100 watts DSB available. He has built new converters, tuneable IF strip with Collins mechanical filter. Stan will also be resuming his Sunday morning calls from 1-12-73, calling on the hour from 0800 to 1300 EDT, mostly operating on 52.000 MHz.

Contests

with Peter Brown VK4PJ

Federal Contests Manager, G.P.O. Box, 638 Brisbane, Qld., 4001.

Notes on the John Moyle Memorial National Field Day rules.

There is a separate section this year for VHF operators, brought about by the interest in last year's RO Contest. Entrants in sections (a), (b), (c), and (d), of course can operate VHF but obviously cannot enter section (e).

You will note that Portable Field Stations may make a second contact with another Portable Field Station after a lapse of 4 hours while the now accepted rule for VHF operators, of repeat contacts after 2 hours, stands.

If there are sufficient entries in section (d), multiple operation, I will separate entries into phone and open, and there will probably be sufficient entries. The rules could have contained this I suppose but don't you think they are contained enough?

Similarly for section (a) with Portable Field Stations and Mobiles. We did not do so well with the ZLs last year and I do not know their Field Day dates this year. I have a message Jack ZLCK, NZART Contest Manager, would like to advise you next month. If there are good openings we will help each other a lot.

Note that CW CW contacts count double.

Fixed Home Stations. What about giving the blokes out in the field something to talk about? Make them feel that their effort getting out in the field is worthwhile. When you come home on Saturday night after the show (or a party) get on the air and look for a field station or two - before breakfast will do - or before lunch.

CONTEST CALENDAR.

December 17th and 8th ARRL 160 CW Contest.
December 15th & 16th ARRL New 10 metre Contest.
December 22nd & 23rd Hungarian Contest.

Rose Hill Memorial VHF Contest is on **NOVEMBER** Rules in October "4A".

John Moyle Memorial National Field Day, February 8th and 10th, 1974.

Central Coast Amateur Radio Club Field Day, February 24th, 1974.

ARRL National QRP competition.

Phone, for full weekends in February and March.
CW, 3rd full weekends in February and March.

ARRL New 10 Metre Contest.

From 1200 GMT Dec 15th 1973 to 2359 GMT Dec 16th 1973. No limitation. Single transmitter only. Single or Multiple.

USA & Canada transmit signal report and state or province.

Others transmit signal report and serial number beginning with DO1.

One contact on phone, phone and one contact CW-CW. Anywhere.

Oscar 6 contacts count. Cross mode does not count CW on 28.0-28.5MHz, 2 points for 2 very exchange 4 points for W or K voice contact. Multiple contacts of the number of different states, Canadian call areas, VE1-8, VO, ITU regions and countries as ARRL list. First contact QSD points X multiplier.

Entries to be postmarked no later than Jan 21st 1974.

REMEMBRANCE DAY CONTEST

As well as the entrants listed last month, quite a few others also helped make the contest such a success, namely VKs 7MR, 3IC 3A20, 3BMD, 3ARS, 3ANE, 8DJ, 3AH, and Aquinas Radio Club.

VK9JD made a great effort with 2139 points and 877 contacts.

VK3AM prepared VK92C's W1 to island log.

You will be interested to know that Doug VK7AZ who scored 1521 points with 631 contacts is a blind on looked after for the contest by Andrew VK7AW.

Eric VK4CQ was to be the most successful of quite a few V1 and VYL ops who are pleased to have with us.

I have a few more interesting items on the RD for next month.

Book yourself in for next year's RD and help make it a most successful FRIENDLY contest.

ROSS HULL MEMORIAL VHF-VHF CONTEST.

How many contacts have you made so far???

Do not put off getting into the contest because time

John Moyle memorial national field day contest 1974

Amateur Operators and Short Wave Listeners are invited to help make the contest, held in memory of the late John Moyle, a huge success.

Contestants may participate either as individuals or as part of a group. There are two Divisions (part) in this contest. 1-24 hour continuous operation Division and 2-8 hour continuous operation Division, to be carried out within the 26 hours available. Dates and Times.

From 0800 GMT, February 9, 1974 to 0800 GMT, February 10, 1974.

The operators of Portable Field Stations or Mobile Stations within VK call areas will endeavour to contact other Portable, Mobile or Fixed stations in VK, ZL and foreign call areas, on all bands.

Rules.

1 - In each Division, 24 hour or 8 hour, the operating period must be continuous.

2 - In each Division there are 7 sections.

(a) Portable Field station, transmitting, phone.

(b) Portable Field station, transmitting, CW.

(c) Portable Field station, transmitting, open.

(d) Portable Field station, transmitting, open, multiple operation.

(e) VHF Portable Field station or Mobile station, transmitting.

(f) "Home" transmitting stations.

(g) Receiving portable and mobile stations.

3 - Contestants must operate within the terms of their licence.

4 - A Portable Field station must operate from a power supply which is independent of a vehicle or permanent installation.

5 - No apparatus may be set up on site within 24 hours of the contest.

6 - All amateur bands may be used but cross band operation is not permitted.

7 - Cross mode is permitted.

8 - All operators of a multi-operator station must be located within an approximate half mile diameter circle 1000 metres.

9 - Each multi-op transmitter should maintain a separate log.

10 - All multi-op stations logs should be submitted under the one call-sign.

11 - One only multi-op transmitter may operate on a band at a time.

12 - RS or RST reports should be followed by serial numbers beginning 001 etc.

13 - Scoring. For Portable Field stations and mobiles.

Portable Field Stations and mobiles, outside entrants call area . . . 15 points.

Portable Field Stations and mobiles, inside entrants call area . . . 10 points.

"Home" stations outside the entrants call area 5 points.

"Home" stations within the entrants call area . . . 2 points.

14 - Portable Field stations outside entrants call area 15 points.

15 - Portable Field stations within entrants call area 10 points.

16 - Operation via active repeaters or translators is not acceptable for scoring.

17 - All logs shall be set out under head name of Date-time, in GMT, Band, Emission, Call-sign, RS-T sent, RS-T received, Points claimed.

18 - Contestants in correct sequence. There MUST be a front sheet to sheet about Name, Address, Division, Section, Call-sign, Call-signs of other operators, Location, Points Claimed, Equipment used, Power supply, I herewith certify that I have operated in accordance with the rules and spirit of the contest.

19 - Certificates will be awarded to the highest score of each section of the 6 hour and 24 hour Divisions. The 8 hour certificate cannot be won by a 24 hour entrant.

Additional certificates will be awarded for excellent performance.

20 - Entrants in sections (a), (b), (c), (d), and (e) must state how power for transmitting is derived.

21 - All CW-CW contacts count double.

22 - Entries must be forwarded in time to be opened on 22nd March, 1974. Clearly mark your envelope that it is a John Moyle Memorial National Field Day entry and address to Federal Contest Manager, VWA, Box 638, GPO Brisbane, 4001.

I like to hear that you enjoyed the contest and your suggestions may add weight to like suggestions from others.

Please read my notes on the rules, that follow.

RECEIVING SECTION.

This section is open to all Short Wave Listeners in VK call areas. Rules, as applicable, are as the transmitting station rules but logs do not have to show report and serial number of the second station or station called.

Logs must show the call sign of the portable or mobile station heard, and report the serial number sent by that station, and the call sign of the station called.

Scoring will be as transmitting stations score. A station calling CQ does not count. Portable Mobile stations, which must be used in the left hand call column, alone count for scoring. Stations in the right hand column may be any station contacted.

A certificate will be awarded to the highest scorer of each of the 6 hour and 24 hour Divisions, individual multiple operator entries. Certificates will be awarded for excellent performance. Note rule 21.

18 - Contestants must operate within the terms of their licence.

19 - Each multi-op transmitter should maintain a separate log.

20 - All multi-op stations logs should be submitted under the one call-sign.

21 - One only multi-op transmitter may operate on a band at a time.

22 - RS or RST reports should be followed by serial numbers beginning 001 etc.

23 - Scoring. For Portable Field stations and mobiles.

Portable Field Stations and mobiles, outside entrants call area . . . 15 points.

Portable Field Stations and mobiles, inside entrants call area . . . 10 points.

"Home" stations outside the entrants call area 5 points.

"Home" stations within the entrants call area . . . 2 points.

14 - Portable Field stations outside entrants call area 15 points.

15 - Portable Field stations within entrants call area 10 points.

16 - Operation via active repeaters or translators is not acceptable for scoring.

17 - All logs shall be set out under head name of Date-time, in GMT, Band, Emission, Call-sign, RS-T sent, RS-T received, Points claimed.

18 - Contestants in correct sequence. There MUST be a front sheet to sheet about Name, Address, Division, Section, Call-sign, Call-signs of other operators, Location, Points Claimed, Equipment used, Power supply, I herewith certify that I have operated in accordance with the rules and spirit of the contest.

19 - Certificates will be awarded to the highest score of each section of the 6 hour and 24 hour Divisions. The 8 hour certificate cannot be won by a 24 hour entrant.

Additional certificates will be awarded for excellent performance.

20 - Entrants in sections (a), (b), (c), (d), and (e) must state how power for transmitting is derived.

21 - All CW-CW contacts count double.

22 - Entries must be forwarded in time to be opened on 22nd March, 1974. Clearly mark your envelope that it is a John Moyle Memorial National Field Day entry and address to Federal Contest Manager, VWA, Box 638, GPO Brisbane, 4001.

I like to hear that you enjoyed the contest and your suggestions may add weight to like suggestions from others.

Please read my notes on the rules, that follow.

RECEIVING SECTION.

This section is open to all Short Wave Listeners in VK call areas. Rules, as applicable, are as the transmitting station rules but logs do not have to show report and serial number of the second station or station called.

Logs must show the call sign of the portable or mobile station heard, and report the serial number sent by that station, and the call sign of the station called.

Scoring will be as transmitting stations score. A station calling CQ does not count. Portable Mobile stations, which must be used in the left hand call column, alone count for scoring. Stations in the right hand column may be any station contacted.

A certificate will be awarded to the highest scorer of each of the 6 hour and 24 hour Divisions, individual multiple operator entries. Certificates will be awarded for excellent performance. Note rule 21.

18 - Contestants must operate within the terms of their licence.

19 - Each multi-op transmitter should maintain a separate log.

20 - All multi-op stations logs should be submitted under the one call-sign.

21 - One only multi-op transmitter may operate on a band at a time.

22 - RS or RST reports should be followed by serial numbers beginning 001 etc.

23 - Scoring. For Portable Field stations and mobiles.

Portable Field Stations and mobiles, outside entrants call area . . . 15 points.

Portable Field Stations and mobiles, inside entrants call area . . . 10 points.

"Home" stations outside the entrants call area 5 points.

"Home" stations within the entrants call area . . . 2 points.

14 - Portable Field stations outside entrants call area 15 points.

15 - Portable Field stations within entrants call area 10 points.

16 - Operation via active repeaters or translators is not acceptable for scoring.

17 - All logs shall be set out under head name of Date-time, in GMT, Band, Emission, Call-sign, RS-T sent, RS-T received, Points claimed.

18 - Contestants in correct sequence. There MUST be a front sheet to sheet about Name, Address, Division, Section, Call-sign, Call-signs of other operators, Location, Points Claimed, Equipment used, Power supply, I herewith certify that I have operated in accordance with the rules and spirit of the contest.

19 - Certificates will be awarded to the highest score of each section of the 6 hour and 24 hour Divisions. The 8 hour certificate cannot be won by a 24 hour entrant.

Additional certificates will be awarded for excellent performance.

20 - Entrants in sections (a), (b), (c), (d), and (e) must state how power for transmitting is derived.

21 - All CW-CW contacts count double.

22 - Entries must be forwarded in time to be opened on 22nd March, 1974. Clearly mark your envelope that it is a John Moyle Memorial National Field Day entry and address to Federal Contest Manager, VWA, Box 638, GPO Brisbane, 4001.

I like to hear that you enjoyed the contest and your suggestions may add weight to like suggestions from others.

Please read my notes on the rules, that follow.

RECEIVING SECTION.

This section is open to all Short Wave Listeners in VK call areas. Rules, as applicable, are as the transmitting station rules but logs do not have to show report and serial number of the second station or station called.

Logs must show the call sign of the portable or mobile station heard, and report the serial number sent by that station, and the call sign of the station called.

Scoring will be as transmitting stations score. A station calling CQ does not count. Portable Mobile stations, which must be used in the left hand call column, alone count for scoring. Stations in the right hand column may be any station contacted.

A certificate will be awarded to the highest scorer of each of the 6 hour and 24 hour Divisions, individual multiple operator entries. Certificates will be awarded for excellent performance. Note rule 21.

18 - Contestants must operate within the terms of their licence.

19 - Each multi-op transmitter should maintain a separate log.

20 - All multi-op stations logs should be submitted under the one call-sign.

21 - One only multi-op transmitter may operate on a band at a time.

22 - RS or RST reports should be followed by serial numbers beginning 001 etc.

23 - Scoring. For Portable Field stations and mobiles.

Portable Field Stations and mobiles, outside entrants call area . . . 15 points.

Portable Field Stations and mobiles, inside entrants call area . . . 10 points.

"Home" stations outside the entrants call area 5 points.

"Home" stations within the entrants call area . . . 2 points.

14 - Portable Field stations outside entrants call area 15 points.

15 - Portable Field stations within entrants call area 10 points.

16 - Operation via active repeaters or translators is not acceptable for scoring.

17 - All logs shall be set out under head name of Date-time, in GMT, Band, Emission, Call-sign, RS-T sent, RS-T received, Points claimed.

18 - Contestants in correct sequence. There MUST be a front sheet to sheet about Name, Address, Division, Section, Call-sign, Call-signs of other operators, Location, Points Claimed, Equipment used, Power supply, I herewith certify that I have operated in accordance with the rules and spirit of the contest.

19 - Certificates will be awarded to the highest score of each section of the 6 hour and 24 hour Divisions. The 8 hour certificate cannot be won by a 24 hour entrant.

Additional certificates will be awarded for excellent performance.

20 - Entrants in sections (a), (b), (c), (d), and (e) must state how power for transmitting is derived.

21 - All CW-CW contacts count double.

22 - Entries must be forwarded in time to be opened on 22nd March, 1974. Clearly mark your envelope that it is a John Moyle Memorial National Field Day entry and address to Federal Contest Manager, VWA, Box 638, GPO Brisbane, 4001.

I like to hear that you enjoyed the contest and your suggestions may add weight to like suggestions from others.

Please read my notes on the rules, that follow.

RECEIVING SECTION.

This section is open to all Short Wave Listeners in VK call areas. Rules, as applicable, are as the transmitting station rules but logs do not have to show report and serial number of the second station or station called.

Logs must show the call sign of the portable or mobile station heard, and report the serial number sent by that station, and the call sign of the station called.

Scoring will be as transmitting stations score. A station calling CQ does not count. Portable Mobile stations, which must be used in the left hand call column, alone count for scoring. Stations in the right hand column may be any station contacted.

A certificate will be awarded to the highest scorer of each of the 6 hour and 24 hour Divisions, individual multiple operator entries. Certificates will be awarded for excellent performance. Note rule 21.

18 - Contestants must operate within the terms of their licence.

19 - Each multi-op transmitter should maintain a separate log.

20 - All multi-op stations logs should be submitted under the one call-sign.

21 - One only multi-op transmitter may operate on a band at a time.

22 - RS or RST reports should be followed by serial numbers beginning 001 etc.

23 - Scoring. For Portable Field stations and mobiles.

Portable Field Stations and mobiles, outside entrants call area . . . 15 points.

Portable Field Stations and mobiles, inside entrants call area . . . 10 points.

"Home" stations outside the entrants call area 5 points.

"Home" stations within the entrants call area . . . 2 points.

14 - Portable Field stations outside entrants call area 15 points.

15 - Portable Field stations within entrants call area 10 points.

16 - Operation via active repeaters or translators is not acceptable for scoring.

17 - All logs shall be set out under head name of Date-time, in GMT, Band, Emission, Call-sign, RS-T sent, RS-T received, Points claimed.

18 - Contestants in correct sequence. There MUST be a front sheet to sheet about Name, Address, Division, Section, Call-sign, Call-signs of other operators, Location, Points Claimed, Equipment used, Power supply, I herewith certify that I have operated in accordance with the rules and spirit of the contest.

19 - Certificates will be awarded to the highest score of each section of the 6 hour and 24 hour Divisions. The 8 hour certificate cannot be won by a 24 hour entrant.

Additional certificates will be awarded for excellent performance.

20 - Entrants in sections (a), (b), (c), (d), and (e) must state how power for transmitting is derived.

21 - All CW-CW contacts count double.

22 - Entries must be forwarded in time to be opened on 22nd March, 1974. Clearly mark your envelope that it is a John Moyle Memorial National Field Day entry and address to Federal Contest Manager, VWA, Box 638, GPO Brisbane, 4001.

I like to hear that you enjoyed the contest and your suggestions may add weight to like suggestions from others.

Please read my notes on the rules, that follow.

RECEIVING SECTION.

This section is open to all Short Wave Listeners in VK call areas. Rules, as applicable, are as the transmitting station rules but logs do not have to show report and serial number of the second station or station called.

Logs must show the call sign of the portable or mobile station heard, and report the serial number sent by that station, and the call sign of the station called.

Scoring will be as transmitting stations score. A station calling CQ does not count. Portable Mobile stations, which must be used in the left hand call column, alone count for scoring. Stations in the right hand column may be any station contacted.

A certificate will be awarded to the highest scorer of each of the 6 hour and 24 hour Divisions, individual multiple operator entries. Certificates will be awarded for excellent performance. Note rule 21.

18 - Contestants must operate within the terms of their licence.

19 - Each multi-op transmitter should maintain a separate log.

20 - All multi-op stations logs should be submitted under the one call-sign.

21 - One only multi-op transmitter may operate on a band at a time.

22 - RS or RST reports should be followed by serial numbers beginning 001 etc.

23 - Scoring. For Portable Field stations and mobiles.

Portable Field Stations and mobiles, outside entrants call area . . . 15 points.

Portable Field Stations and mobiles, inside entrants call area . . . 10 points.

"Home" stations outside the entrants call area 5 points.

"Home" stations within the entrants call area . . . 2 points.

14 -

BRIGHT STAR CRYSTALS

- PROMPT DELIVERY GUARANTEED
- ALL TYPES OF MOUNTINGS

Such as HC6/U (style D) . . . HC18/U (style J) . . . HC25/U (style K) . . .
etc. . . Frequency range up to 140MHz on 5th overtone.



- ACCURACY
- STABILITY
- ACTIVITY
- OUTPUT

Our increased production now enables us to offer Special Discounts from 10%
Let us quote you for all your Crystal requirements.
Our easy-to-read Price List is now available.

BRIGHT STAR CRYSTALS PTY. LTD.

35 EILEEN ROAD, CLAYTON, VIC., 3168. Phone: 546-5076 (Area Code 03).

INTERSTATE AGENTS:

Sydney: PARIS RADIO ELECTRONICS, 7a Burton Street, Darlinghurst, N.S.W.
2010, Phone: 31-3273.

Perth: W. J. MONCRIEFF PTY. LTD., 176 Wittenoom Street, East Perth,
6000, Phone: 25-5722, 25-5902.

Brisbane: FRED HOE & SONS PTY. LTD., 246 Evans Road, Salisbury North,
4107, Phone: 47-4311

Adelaide: ROGERS ELECTRONICS, P.O. Box 3, Modbury North, S. A.
5092, Phone: 64-3296.

MAKE A NEW YEAR RESOLUTION

Resolve to buy a ticket in the
VK6 Division Raffle

or a
FT dx 401 + Accessories
LOOK AT THE PRIZE LIST

1st Prize:
QANTAS EXCURSION TO
LONDON **\$654**
or
14 Days Holiday motel
accommodation by Ansett **\$650**
or
Any holiday of choice to value
of **\$650**
YAESU FT dx 401 + Access-
ories **\$650**

2nd Prize:
Five year subscription to
W.I.A. **\$60**

3rd Prize:
Portable typewriter **\$50**

4th Prize:
Five L.P. Records of choice
\$30

5th Prize:
Bedroom Rug **\$25**

8th Prize:
Hamper of Groceries **\$25**
7th Prize:
50 Gallons of Petrol **\$24**
8th Prize:
Steam or Dry Iron **\$20**
9th Prize:
Surf Board & Bathers **\$15**
10th Prize:
Perfume **\$15**

Closing Date
JANUARY 8th, 1974
HURRY! HURRY! HURRY!
Send your remittance to—
The Treasurer, W.I.A.,
W.A. Division
Box N1002, G.P.O. Perth, W.A.
6001
Full book of tickets at \$4.00
Half book of tickets at \$2.00
5 tickets for \$1.00

Postmaster-General's Department AMATEUR OPERATORS' CERTIFICATES OF PROFICIENCY Examination, Section M (Theory), August, 1973.

(Time allowed — 2½ hours)

NOTE: — SEVEN questions only to be attempted.
Credit will not be given for more than SEVEN
answers. All questions carry equal marks.

- In relation to the final class C radio-frequency power-amplifier stage of a transmitter:
 - explain why the anode current varies as the tank circuit is brought into resonance; and
 - state whether the anode current will vary when a resonant aerial is coupled to the tank circuit. Explain.
- Assisted by a circuit diagram, describe the operation of a mains operated power supply which uses silicon diodes. The power supply is required to provide a regulated output of 8 volts to supply a crystal oscillator and an unregulated output of 9 volts for the buffer stage of a transistor type transmitter.
- With reference to single-sideband suppressed-carrier transmission and reception discuss the functions of the following:
 - the balanced modulator;
 - the product detector; and
 - the final class B linear R.F. amplifier.
- (a) Describe the process by which high-frequency radio waves may be propagated over long distances and explain why frequency changes may be necessary to maintain continuous service over a long distance communication path, e.g. — Australia to England.
(b) Discuss the effects of the eleven year sunspot cycle on the use of frequency bands allocated to the amateur service.
- With the assistance of a circuit diagram, describe the operation of a device suitable for measuring the ratio of forward to reverse power present in a transmission line feeding radio-frequency to an antenna.
- (a) Aided by a sketch, describe the construction and principle of operation of a moving-coil (dynamic) type of microphone.
(b) Discuss the relative merits and demerits of a moving-coil and carbon type of microphone as regards fidelity and sensitivity.
- (a) Define the terms:
 - parasitic oscillation;
 - harmonic radiation; and
 - self oscillation.
(b) Indicate two possible causes of parasitic oscillation in a transmitter.
(c) Describe how you would locate and suppress such a condition.
- With the assistance of a sketch showing approximate dimensions and component values, explain the theory of operation of an antenna which uses "traps" to enable it to be used for multiband operation within the amateur bands.
- (a) Explain the meaning of the term "resonance";
(b) Indicate how the impedance of a series resonant circuit changes as the applied A.C. voltage is varied in frequency;
(c) Calculate the resonant frequency of an inductor of 30 microhenries and a capacitor of 120 picofarads.

Ionospheric Predictions

with Bruce Bathols, VK3ASE December 1973.

This information is obtained from data supplied by the Ionospheric Prediction Service Division of the Bureau of Meteorology. Times stated as G.M.T.

28MHz — (Propagation predicted possible for approx. 40 per cent of the month).

East Coast to
SU 0500-0900
KH6 2000-0800
G(S.P.) 0800-1000
VE3(S.P.) 2100-2200
UA 0500-1000
W1 2100-2200
VK9 2100-1000
W6 2100-0100
JA 2200-0800

VK6 to
SU 0400-1300
KH6 0300-0700
G(S.P.) 0900-1300
VE3(S.P.) 0500-0700
UA 0100-0700

21MHz
VK2 to
SU 0500-1100
ZS 0700-1100
G(S.P.) 0800-1100
VE3(S.P.) 1800-2000-2200
UA 0500-1100
W6 2000-0200
VK6 to
SU 0500-1400
ZS 0600-1300
G(S.P.) 0800-1400
VE3(S.P.) 1600
UA 0500-1200
W6 2300-0200

East Coast to **14MHz**
SU 2400-2400
KH6 0900-2400
ZS 0400-1300, 1800-2100
G(S.P.) 1200-1600, 2000-2200
G(L.P.) 0700-1600
VK1 0900-1400
VE3(S.P.) 1900-1400
VE3(L.P.) 1400-1700, 2000-2200
UA 0600-1400
W1 1300-2000
VK9 2400-2400
PY 2400-0400, 1000
W6 1600-2100
JA 0500-1200, 2100-2300
BG1(S.P.) 1400-2400
BG1(L.P.) 0400, 0700-2100

VK6 to
SU 1000-2400
ZS 0200-0300, 1200-2300
G(S.P.) 0900-1700
G(L.P.) 0900-1600
VE3(S.P.) 1400-2400
VE3(L.P.) 1100, 2200-2400
UA 0800-1500
W6 1600-2200

7MHz
VK2 to
SU 1400-2000
ZS 1700-1900
G(S.P.) 1300-2000
G(L.P.) 0900
VE3(S.P.) 0600-1400
UA 1100-2000
W6 0800-1600

Sunset Numbers Predictions —
December 29, January 28, February 27, March 26.
— Mean for September '73 — 80.8
— Smoothed mean for March '73 — 43.6
— Swiss Federal Observatory, Zurich.

Hamads

WANTED TO SELL

MR3A Carphone, ex. cond. spare set valves incl. 2 finals ch. A.B.C., \$40. 3" Oscilloscope JY EA \$20. 52MHz Conv. Mar. 63 EA \$2.99. Tony, VK2ZKA Ph. (02) 663-7338.

National HRO RX 800kHz-30MHz general coverage full set band spread coils, amateur bands. Fitted modern valves. Product detector, Mechanical Filter, manual, etc. **\$110.00**

W6LKL QTHR (092) 37-2202.
Wide Band Oscilloscope, Home brew, all transistorised. Working in broadband condition. Comes with circuit diagrams and two new double beam cathode ray tubes. **\$58.00**
VK3AOH, QTHR.

AT29 Base Station TX made by STC for RAAF, 2 units mounted vert. 6 ft. or horiz. 4 stages on slide-out racks, modified for amateur use and passed by PMG. Freqs 80/40/20. Complete working order. Instruction manual. **\$58.00**
VK3VG, QTHR, Ph. (03) 850-1894.

Tower Gale, Crank-up, Tall-over installed in pleasant garden setting, together with radio amateur's comfortable B.V. Home, comar stairs, good DX. Both items available early next year, must sell together. Enquire **VK3VG, QTHR**, Ph. (03) 850-1894.

Swan 128 Transceiver and power supply, excellent condition, \$120.

ONO, VK2ABC, QTHR, Ph. (02) 451-1313.

Transceiver 55B and AM, 5 bands, upper and lower sideband, CW. Vox. incremental tuning 500 Watts PEP. Well looked after. JA manufacture model TE1200 QTR, 3 years old, nearly all solid state. Price \$350. 240V supply built in. Final Blower. R. Richardson, VK2ALR, 12 Boulden Street, North Parramatta, N.S.W., 2151.

TACAN Base Stations, One partially scrapped, the other converted to VHF FM. Good quality sub-chassis containing receivers, drivers, transmitters and high voltage/high current stabilised power supplies. 2 prop pitch motors and selsyns. Offers wanted. **VK1CR, QTHR.**

Violet MTR20 Carphone operating on 2mFM, 6 channel switching. With Xials for Ch. 1, Ch. 4, Ch8 and Ch. 4 reverse. 3/20 final 52V. Good go-er complete \$180.00. ONO, VK3ASO, QTHR.

Realistic DX150A Solid State Communications RX, perfect condition, selectivity & sensitivity excellent, perfect for the SWL. **\$189.00** ONO.

3 Milne, P.O. Box, Mildura, 3690, Ph. (050) 24-5493.

PROX408 RX 2m and FM options with Xials both spare 25 MHz channels installed. Complete spare set 22 proper Jap transistors. Very little used. **\$350** ONO. Birch, VK3ASO, Ph. (054) 43 1877 Bus.

WANTED TO BUY

Transceiver, FTV 650, Ph. (060) 71-6211.
AM (060) 71-7244.

Signal Generator, VHF 30 to 200MHz with calibrated output attenuator to one microvolt or less. Eric Gray VK3ZSB, QTHR, Bus. (03) 830-5656.
AM (03) 25-3248.

Cathode Ray Tube type: 4EP1, 4EP31, CH10-94 or CH10-78 or any other equivalent of these.
D. Perry, 47 Trigg Street, Blair Athol, S.A., 5009. Ph. (08) 62-5305.

Receiver 8-MHz command or similar RX for use as tunable IF. Need not be complete—Basics will do. **VK3ZOG, QTHR**, Ph. (03) 877-3523.

Silent Keys

H. Pearson—VK2BPR

It is with deep regret that we record the passing of Harry Pearson, VK2BPR.

Although Harry only had his licence for just on twelve months, he enjoyed immensely participating in the Amateur Service, particularly on CW, and was an active Operator on the regular N.S.W. South West Zone Monday night net. In the short time he was on the air he often took part in the Sunday CW net, achieved a "Hunter's Club Certificate" from the I.R.S., became a member of the "Kx Club" (Certificate No. 49), was participating in the "Commonwealth Electorates Award", planned to take part in the "Jamboree on the Air", a first ever for Kharcolan based Boy Scouts, and recently attended the South West Zone Convention at Ilabo, N.S.W.

Although Harry was known to many only as an active Amateur, few were aware that he also held the onerous position of Regional Engineer in charge of the Operations and Maintenance of the plant 1,500 Megawatt Snow-Murray complex of the Snowy Mountains Hydro-Electric Scheme.

Harry passed away suddenly after a heart attack at his QTH on Monday, October 8 1973, and to his wife and family we extend our deepest sympathy. He will be missed by many Amateurs, both far and near.

John G. O'Brien.

W. J. Zech VK2ACP

It is with deep sorrow that we record the passing of one of our older hams William J. Zech, VK2ACP.

Bill passed away on the 8th of August 1973 at Katoomba after a short illness, aged 80.

Bill was first licensed in 1912 with the call XABQ. He moved to Victoria for some time and was issued with VK3WZ after having VK2WZ when the VK calls were started. He later moved back to VK2 and held VK2ACP until his death.

Bill's early activities are a little vague, but it was known that he was a marine operator for some years. He was secretary of the Leichhardt and District Radio Club in 1924. Although quite active throughout his life he became almost blind in later years and found it almost impossible to use his AT21 transmitter. He moved to a nursing home and a Heathkit on 20 Mhz until his death.

Bill had many friends with whom he corresponded, on and off the air. He was known to many Hammers as "Uncle Bill", never failing to send a card for a Birthday or Christmas. He was so sadly missed by many who owe their start in amateur radio to him.

With much regret we say 73 Bill.

Dan Cliff VK2DC.

FOR YOUR—

YAESU MUSEN

AMATEUR RADIO EQUIPMENT

in
PAPUA-NEW GUINEA

Contact the Sole Territory Agents—

SIDE BAND SERVICE

P.O. Box 795, Port Moresby

Phones 2566, 3111



DICK SMITH ELECTRONICS PTY. LTD.

ELECTRONIC & COMMUNICATION ENGINEERS

Newly imported from U.S.

HUSTLER AMATEUR ANTENNAS

Our first limited shipment is due in from US about the time this advert appears. Hustler have a great reputation for fixed and mobile antennas. Check your band and send now, they won't last. All prices plus road freight \$2.50.

THE G6-144 A 2-METRE COLINEAR WITH 6dB GAIN. Omnidirectional with extremely low angle of radiation achieved by optimum phasing of $\frac{1}{4}$ wave and $\frac{1}{2}$ wave radiators. 50 ohm. Conservatively rated at 8dB over a $\frac{1}{4}$ wave ground plane though on air tests indicate gains of 9dB at 20 miles or more. Resonant SWR of 1.1:1.6MHz bandwidth for 1.5:1 or better SWR. Rated at 250W FM. Aluminium throughout with a wind loading of only 23 lbs at 100 mph. What more do you need to know but the price **\$69.00**

TYPE G3-144 IS A 5/8th WAVELENGTH WITH 3.6dB GAIN. Has an enclosed non-radiating matching system and $\frac{1}{4}$ wave radiators for complete feedline decoupling assuring all signal radiation from the desired vertical element. 50 ohm feed impedance. Has a resonant SWR of 1.15:1 or better and 8MHz bandwidth for 2:1 or better SWR. Rated at 200W. Supplied ready to mount for only **\$29.00.**

TYPE CG-144 2-METRE COLINEAR WITH 3.2dB GAIN. Optimised gain from this super mobile antenna. Supplied in resonant length, similar specification to the G6-144 but rated at 200W. 76" tall, use the ball mount below (not supplied). Stainless steel elements to minimise wind loading. **\$37.00.**

BBL-420 FOR 420-450MHz MOBILE USE. Mounts on any flat surface. Two half wave colinear giving 5.2dB gain with SWR of 1.5:1 or better. Measures 31" and handles up to 200W. **\$37.90**

QD-1 QUICK DISCONNECTOR. Essential if you keep car in a garage or go under very low bridges, etc. Enables antenna to be removed and replaced rapidly with minimum of fuss **\$15.90. (p&p 75c)**

C32 CHROME BALL MOUNT 100° adjustable swivel ball complete with rubber pad, steel back-up plate, hardware—even a wrench. Only \$6.00. (p&p 75c)

WHILE WE'RE ON THE SUBJECT WE STOCK A COMPREHENSIVE RANGE OF SCALAR ANTENNAS (All p&p 75c).

M60 6-metre $\frac{1}{4}$ wave Fibreglass \$19.35

M22 2-metre $\frac{1}{4}$ wave Fibreglass \$6.75

M21 2-metre $\frac{1}{4}$ wave stainless steel \$6.27

M23 Special 3dB gain with integral base load coil for 144-175MHz \$13.60

M27R 27MHz centre loaded mobile antenna \$15.55

MK Knockdown adaptor \$6.56

MS Spring adaptor, chromed \$4.37

M68 The very popular Magnabase gives instant fitting on any flat metallic surface. No holes to drill it stays on by magnets. **\$27.60**

Just arrived (12/10/73)

ADVANCE ELECTRONIC CALCULATOR featuring 8 digit LED display with switch to give 12 digit in and out. Does mixed calculations, chain multiples/divides. Selectable decimal point, zero suppression overflow indicator, etc. Uses 9V transistor battery. Try one on our 7-day money back guarantee (also fully Australian guaranteed for 90 days) but don't delay. At \$50 you can't afford not to.

MURATA CERAMIC FILTERS FOR IF USE (full data in our catalogue p&p 30c).

5FD455B features two resonators coupled by external capacitor. Typical selectivity 20dB min at plus or minus 10kHz with 3dB bandwidth of plus or minus 4.5kHz, 55c each.

5FB455A replaces transistor radio IF's 3dB band width of 15kHz plus or minus 3kHz with maximum insertion loss of 5dB. 50c each.

5BF455A improves selectivity by replacing amplifier bypass capacitors in IF stages simplifies alignment. 50c each.

YFL455A is an IF filter giving selectivity 19dB down at plus or minus 10kHz with 3dB bandwidth of 5.5 kHz min **\$2.25 each**

F29 slug for 10MHz to 300MHz 12c each.

4145B (YL1370) tubes in stock again at **\$6.90. (p&p 30c).**

KITS

No space for detailed descriptions, refer to magazines.

D.V.M. (E.A. October '73) complete with case **\$145.**

VHF converter (E.A. August '73) components only, no metalwork **\$27.60.**

6 Metre converter (E.A. August '72) excluding crystal **\$14.50**

BFO (E.A. Aug. '73) very simple way to pick up 656, **\$6.25.**

30 Watt R.F. Amp kit has proved fantastically popular thanks to the tough Solid State Semiconductors. Gives 30 Watts from 300mW on a 12.5 V supply. Saves \$5 on the whole kit at **\$37.60** or see earlier ads for individual stages, transistors, boards etc. (full specs in our new catalogue).

ONLY READ AMATEUR RADIO?

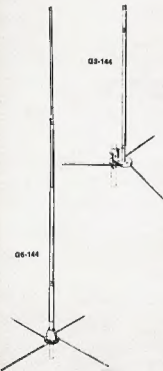
Then you probably missed our new 64 page catalogue which was given away in the October E.A. Not to worry we can supply you with a copy for FREE. Here's what you get: Over 20 pages of pure information—including a page of useful stuff on amateur activities, data on RF transistors, popular IC's, transistors, speaker cabinet, formulae, symbols, suggested circuits. PLUS 50 cent discount vouchers. PLUS new simple mail order form. The catalogue normally sells at 50 cents and it's worth that just for the information on all the products (full specs where possible). We'll let you have a copy for just the p&p—only 30 cents. Please use the coupon or mention Amateur Radio when writing as this is a special offer. Incidentally we must apologise for the rather small print. It would have taken over 200 pages if printed normal size which we couldn't afford. If you have a magnifying glass you'll find it's easy to read!

Dick please send me a copy of your new 64-page catalogue. I enclose 30 cents towards post and packing.

Name

Address

Postcode



DSE



DICK SMITH ELECTRONICS PTY. LTD.

ELECTRONIC & COMMUNICATION ENGINEERS

162 PACIFIC HIGHWAY, GORE HILL, P.O. BOX 747 CROWS NEST 2065 439 5311 (5 LINES)

ASSOCIATED COMPANIES

DICK SMITH (SALES) PTY. LTD., DICK SMITH (WHOLESALE) PTY. LTD., DICK SMITH COMMUNICATIONS PTY. LTD.

SEPHYR PRODUCTS

PTY. LTD., 70 BATESFORD ROAD, CHADSTONE, VIC., 3148. Phone 56-7231

C.G.S

TYPE C MINIATURE VITREOUS ENAMELLED POWER WIREWOUND RESISTORS

Approved to BS 9114 - N002 style 2E-56

SPECIFICATIONS

The 'C' Series of miniature wirewound, vitreous enamelled resistors has been designed to meet the requirements of Specification BS 9114 - N002, and full Qualification Approval has been granted. A Test Report Summary is available on request; this report shows that many of the performance levels are in fact much higher than the specification acceptance levels.

The use of specially selected materials, combined with the application of exacting quality control throughout all stages of production ensures the consistent achievement of a very high standard of reliability.

ELECTRICAL SPECIFICATION

Tolerance: $\pm 5\%$ is standard on values of 1Ω and above and $\pm 10\%$ between 0.1Ω and 1.0Ω . For non standard values and tolerances please consult the factory.

Resistance values: C Series resistors are available with the preferred ohmic values of the E24 Series within the ranges shown in Table 1.

Temperature coefficient: Typically less than 100 ppm/ $^{\circ}\text{C}$ and never exceeding 200 ppm/ $^{\circ}\text{C}$ over the category temperature range -55°C to $+200^{\circ}\text{C}$

MATERIALS

Core: High purity statite ceramic. Chemically inert, capable of withstanding severe thermal shock and impervious to moisture. Ground to close tolerance finish to give maximum contact with wire element for rapid heat transfer.

Resistance Element: High quality nickel-chrome or nickel-copper alloy depending on resistance value; wound at minimum tension.

End Caps: Formed to close tolerances from a special nickel-iron alloy chosen for its consistent welding properties and glass sealing characteristics.

Leads: Solder coated nickel A.

Uncoated leads can be supplied for welding.

Specify - 'weldable leads'.

Performed and cropped leads can also be supplied on request.

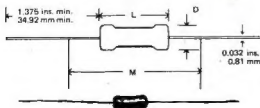
Coating: Humidity proof vitreous enamel with carefully controlled expansion matched to the materials of the resistor.

TABLE 1

C.G.S.			BS 9114 - N002							STYLE CROSS REFERENCE		
Style	Maximum wattage rating @ 20°C	Resistance Range Ω	BS 9114 - N002 Style	Maximum wattage rating @ 70°C	Approved Resistance Range Ω		Critical Resistance Ω	Limiting Element Voltage, Volts		DEF. 5111-1 Style	DEF 5115-2 Style	G.P.O. Style
		min. max.			min.	max.		Normal	Low Air Pressure			
C3A	3	0.1 10K	2E-56-2.5	2.5	1	4.7K	3.9K	100	70	RWV3J	RFH3-2.5	P.O.35
C7	7	0.1 27K	2E-56-6	6	1	15K	6.8K	200	140	RWV4J	RFH3-6	P.O.40
C10	10	0.1 68K	2E-56-9	9	1	68K	27K	500	350	RWV4K	RFH3-9	P.O.36
C14	14	0.2 120K	2E-56-12	12	1	100K	47K	750	530	RWV4L	RFH3-12	-

TABLE 2

Style	Length L		Diam. D		Measuring Distance M		Approx. Weight
	max. in.	max. mm.	max. in.	max. mm.	± 0.062 in.	± 1.59 mm.	
C3A	.499	12.7	0.220	5.6	1.250	31.8	1.0
C7	.874	22.2	0.315	8.0	1.625	41.3	2.0
C10	1.499	38.1	0.315	8.0	2.250	57.2	3.5
C14	2.106	53.5	0.315	8.0	2.875	73.0	5.0



Note: M = resistance measuring points distance - below 10Ω only.